AD-A085 662 SCIENCE APPLICATIONS INC MONTEREY CA F/G 4/2
TROPICAL CYCLONE WIND THREAT FOR THE BAY OF BENGAL.(U)
JUN 79 J D JARRELL AID-SOD-PDC-C-0110
UNCLASSIFIED SAI-1-042-02-219-00 NL

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TROPICAL CYCLONE WIND THREAT FOR THE BAY OF BENGAL.

Progress Report

June 1979

Contract #AID-SOD-PDC-C-0110

SAI-#1-042-02-219-00

Science Applications, Inc.
2999 Monterey-Salinas Highway
Monterey, California 93940

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TROPICAL CYCLONE WIND THREAT FOR THE BAY OF BENGAL

Progress Report

June 1979

A. Objectives:

The ultimate objective of this effort is to provide the OFDA with reliable estimates of damage and casualties that will result from a particular tropical cyclone in the Bay of Bengal.

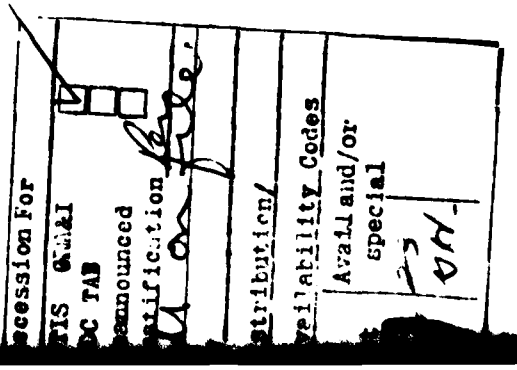
The contract objective is to design, develop, program and test a system suitable for automation to provide wind threat information from tropical cyclones in the Bay of Bengal.

Task 1. Analyze forecast errors to tailor an existing U.S. Navy model to the conditions encountered in the Bay of Bengal.

Task 2. Modify that model to apply it specifically to the geographical points on the periphery of the Bay of Bengal.

Task 3. Conduct a wind forecast error analysis which will form the basis of the estimate of the probability of cyclones exceeding 65 and 100 knots given that winds of a certain level were forecast.

Task 4. Devise a wind threat model which uses the modified Navy model and the probabilities of winds over 65 and 100 knots to determine the joint probability of both the cyclone striking a point and having winds in excess of 65 knots.



Task 5. Conduct real time (or near real time) tests of the model (Task 4) during the Fall 1978 and Spring 1979 Bay of Bengal cyclone seasons. Correct any detected deficiencies in any previous tasks.

Task 6. Report on test results with recommendations.

B. Work Performed to Date:

Task	% of Total	% Completed	% of Total Completed
1	20	95	19
2	10	100	10
3	15	100	15
4	15	100	15
5	25	75	19
6	15	50	8
			85

C. Work has progressed on schedule. It was expected that more than 75% of the work would be done during the first three quarters.

D. Analysis of Progress:

A suitable wind profile has been incorporated into the model. This model is after Riehl (1963). The input is maximum wind, which is then related linearly to radius of maximum wind. This relationship, is based on a study of western Pacific typhoons where (unlike the Bay of Bengal) wind radius information is available.

Summary and Problem Areas:

The work is on schedule. Cyclone 17-79 offered an excellent opportunity for testing. A report of those tests is enclosed.

REPORT ON INDIAN CYCLONE 17-79 (May 1979)

June 1979

Jerry D. Jarrell

Science Applications, Inc.
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REPORT ON INDIAN CYCLONE 17-79 (May 1979)

INTRODUCTION

During early May 1979, a cyclone (Number 17-79) formed in the Bay of Bengal and ultimately struck the coast of the Indian State Andhra Predesh. The damage was extensive but loss of life, while substantial, was surprisingly light. The latter point seems certain to be in part a reflection of preventive measures taken by the Indian government (GOI).

Science Applications, Inc. (SAI) in its Monterey, California office was tracking the cyclone and making wind threat calculations for demonstration and testing purposes. This was required by a contract with the Office of Foreign Disaster Assistance (OFDA), Agency of International Development (AID), U.S. Department of State.

The purpose of this report is to document the behavior of the wind threat model, relate any apparent weaknesses as well as remedial action taken, and to assess the value of this type information to officials facing crucial decisions relative to disaster prevention actions.

For background purposes, only the information available in the bulletins issued by the U.S. Fleet Weather Central/Joint Typhoon Warning Center Guam (JTWC) was used in real time. Forecasts from any agency could have been used so long as their statistical error distribution was understood.

The cyclone lasted from 6 May to 12 May, a total of 25 6-hourly bulletins were received. Wind threat estimates were derived from 23 of the 25 bulletins after the fact. During the cyclone, in near real time, wind threats were derived on 11 warnings. The wind threat estimate requires a total of about 5 minutes to make with a few seconds of this time actually devoted to the computer run. Since SAI is using the Navy's R&D computer at the Fleet Numerical Weather Central (Monterey, California) on a not-to-interfere basis, there were occasions when the computer was not available. For the most part the real-time estimates were discussed with OFDA. Typically this was once per day but became more frequent as landfall approached.

The reason for wind threat estimates is that forecasts are imperfect, and that it is necessary to allow for error when using cyclone forecasts. The wind threat model considers all error possibilities and arrives at a sequence of probabilities that at least 65 kt winds will be observed within a geographic region and within an elapsed time.

Cyclone Description: Figure 1 shows a preliminary post-analysis track of Cyclone #17-79. This was provided through the courtesy of the JTWC. The cyclone formed in the vicinity of the southern Nicobar Islands in the eastern Bay of Bengal. Its ensuing track described a cycloid on 8 May, then a rather routine northwest track making landfall north of Nellore, Andhra Pradesh, on 12 May. Figure 1 gives estimated maximum winds (kts) daily at 0000 GMT along the track. Post analysis indicates winds of 120-130 kts may have been present at landfall.

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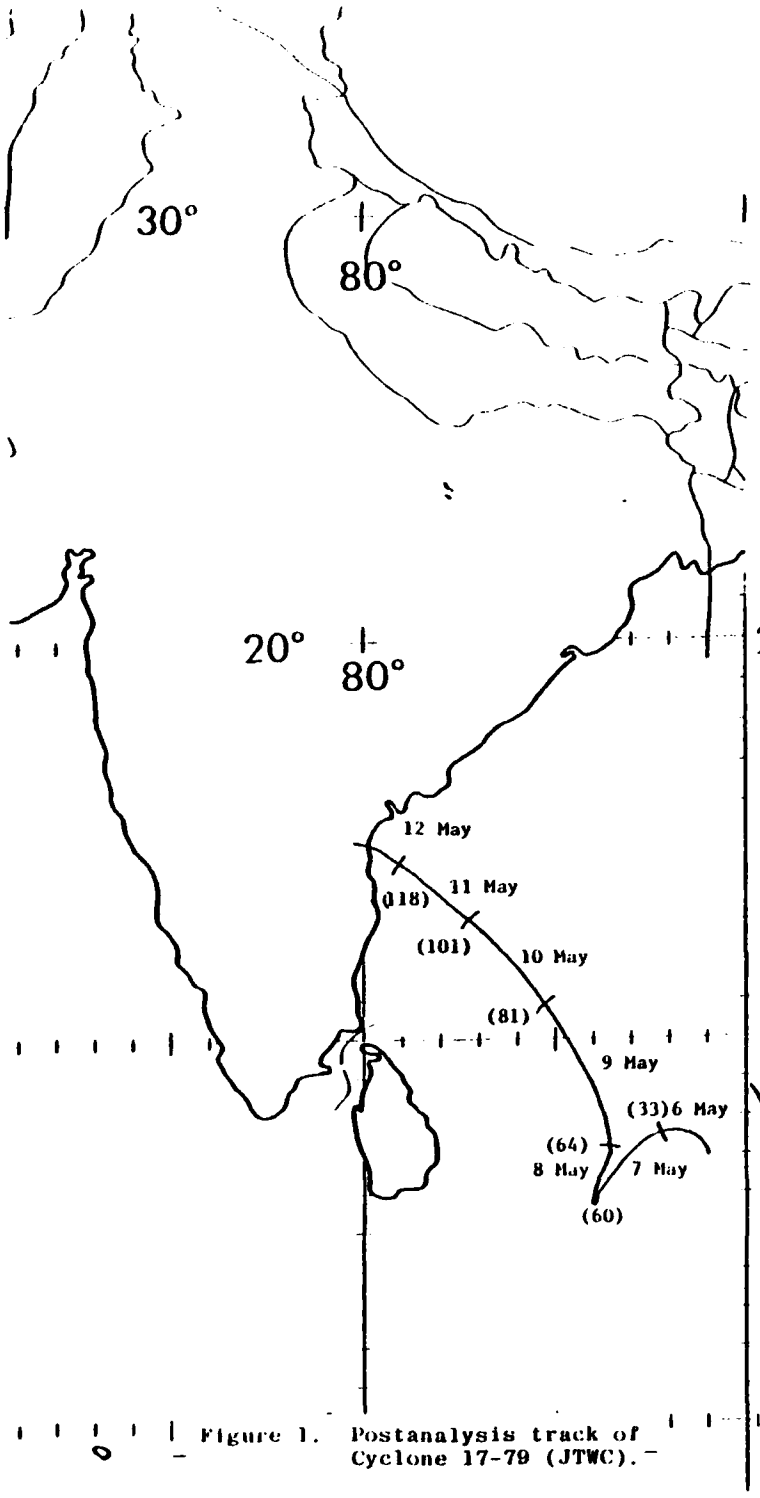


Figure 1. Postanalysis track of Cyclone 17-79 (JTWC).

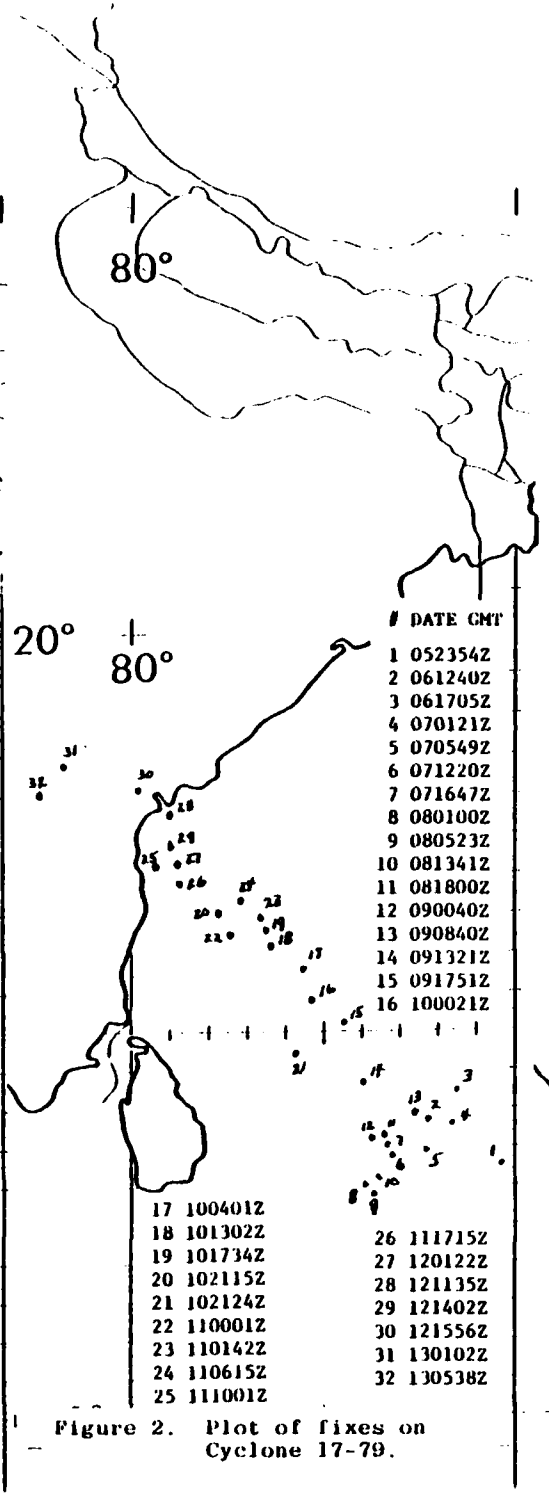


Figure 2. Plot of fixes on Cyclone 17-79.

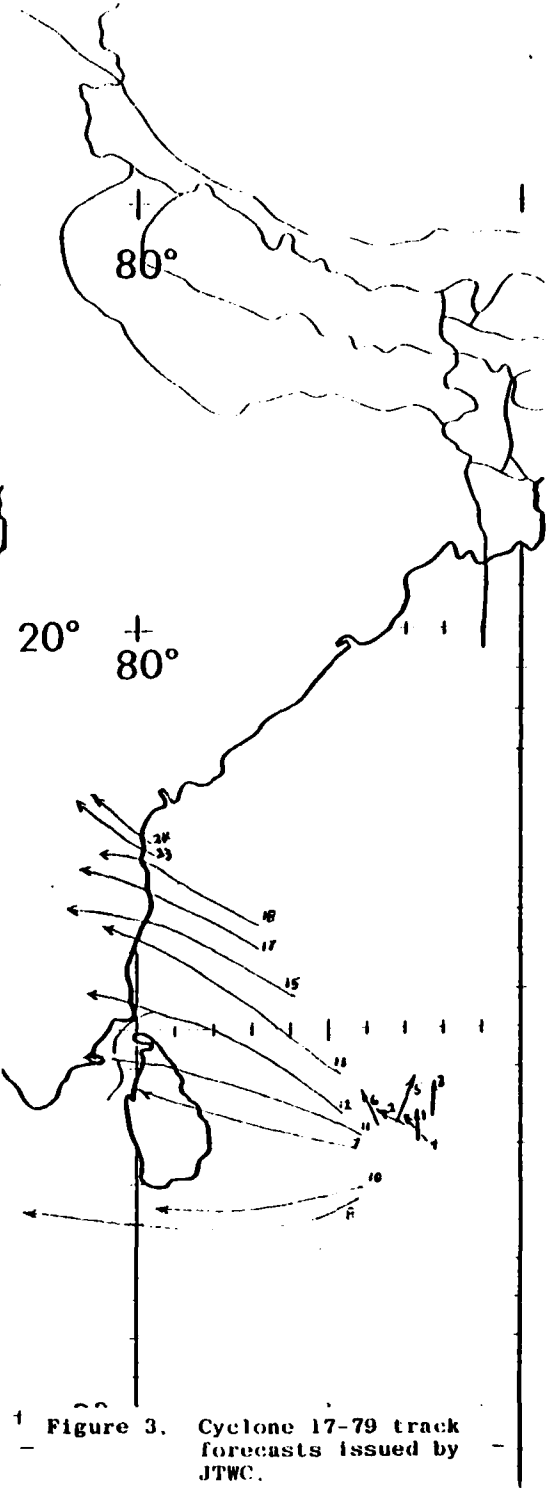


Figure 3. Cyclone 17-79 track forecasts issued by JTWC.

Figure 2 shows a plot of the "fixes" on Cyclone #17-79 received by the JTWC. All fixes were satellite based remotely interpreted either by U.S. Naval Personnel on Diego Garcia or the USAF Global Weather Central (GWC), Offut AFB at Omaha, Nebraska. The Diego Garcia readout is TIROS-N, it is our understanding that the readout equipment at Diego Garcia is not compatible with that satellite and consequently considerable picture distortion results. GWC on the other hand uses stored readout from the Defence Meteorological Satellite Program (DMSP). There are some time delays and occasional distortion problems associated with the cyclone center being far removed from the satellite swath center but this support is generally excellent. To our knowledge other satellite fixes (NESS stored readout, or Japanese GOES for example) nor coastal radar fixes were received by Guam in real time.

Figure 3 shows the track forecasts that were issued by the JTWC. To reduce an already cluttered diagram, only the first 12 hours of the early forecasts are shown, thereafter, until landfall, entire forecasts are shown although some of the late forecasts are omitted for readibility. The small numbers are sequential bulletin number, #1 is 1400 GMT on 6 May and they are at 6-hourly intervals, #24 is 0800 GMT on 12 May. The indecision reflected in the first ten forecasts can be related directly to the noise in the satellite fixes (see figure 2) which in turn illustrates the limitation of our current satellite cyclone fixing capability in the Bay of Bengal. This limitation was particularly evident when Cyclone #17-79 was weak since typically in weak cyclones there are no readily identifiable centers.

Overall the forecasts were average, but those which were issued after the center became better defined (and the positioning became regular and reliable) were in general excellent. After an initial forecast of recurvature toward Burma, the thinking then swung to the west southwest along the path of Cyclone #21-78 into Sri Lanka. Thereafter the forecast track inched northward across Sri Lanka and Tamil Nadu into Andhra Pradesh and actually came close to the path of the devastating cyclone of November 1977. The forecast at one time or another called for landfall on virtually every point on the 600 mile coast from Sri Lanka to 15°N latitude.

We will examine the wind threat estimates derived from the forecasts. Our point will be that even though the forecasts were constantly changing the wind threat for each point followed a conservative pattern of rising to a maximum and then falling as the threat passed.

AREA THREAT

Figure 4 shows these threats integrated over the coasts of Sri Lanka, Tamil Nadu and Andhra Pradesh. These plots are the threat of at least 65 kt (hurricane force) winds occuring within 36 hours after the issuance of each JTWC bulletin. Dates are shown across the top. Shaded bars indicate times when the most recent warning predicted landfall on that coast within 36 hours. The crosshatched area represents the approximate time when 65 kt (or greater) winds were probably occurring. This information can be inferred partly from the forecasts of figure 3. In addition to track forecast changes the threat increases or decreases with forecast speed of motion and forecast

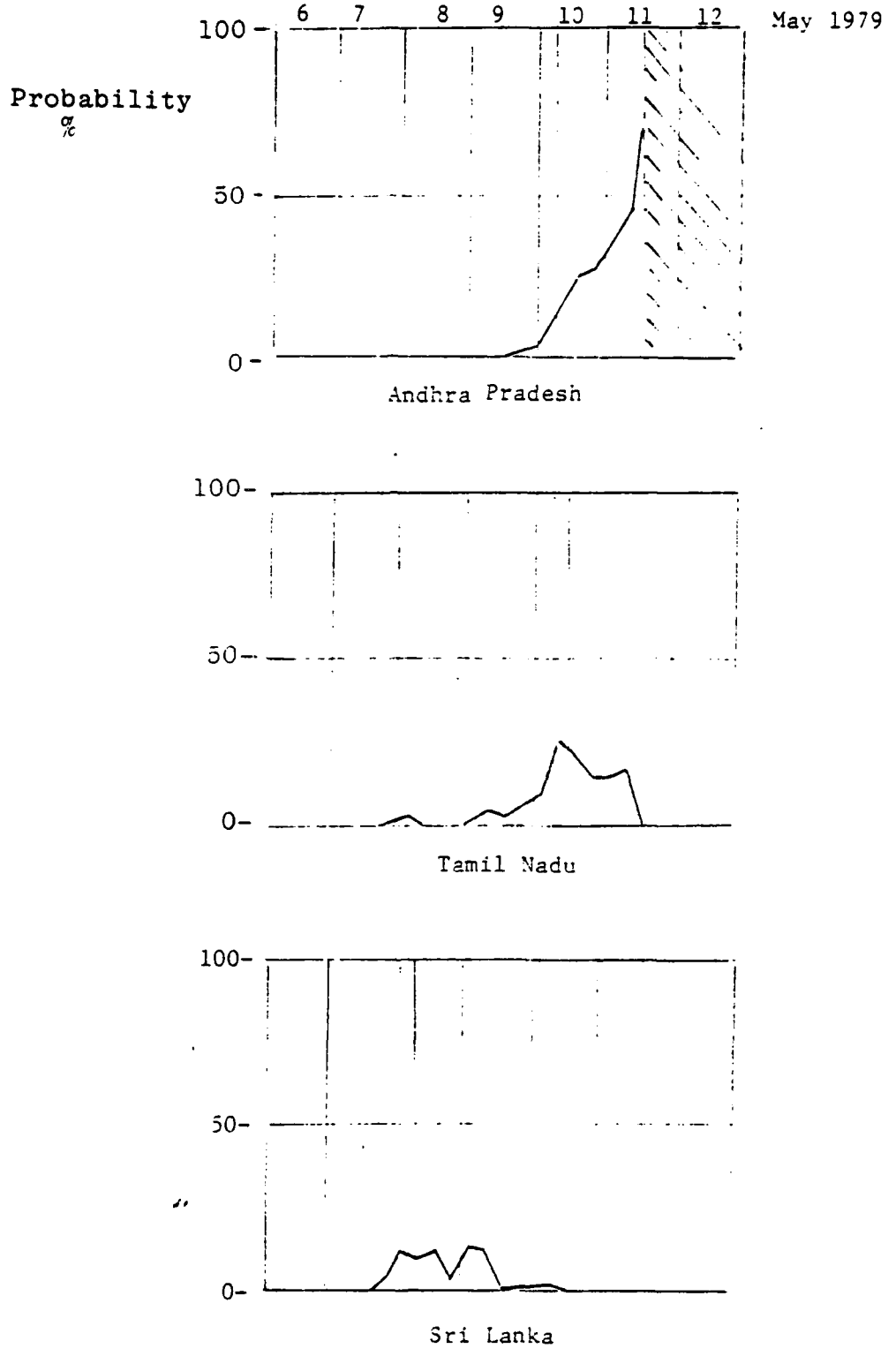


Figure 4. Area summed 36 hour 65 kt wind threat from Cyclone 17-79.

wind speeds. The sharp drop in threat to Sri Lanka on 8 May is due to a much slower motion forecast. Although the forecast at 2000 GMT 8 May was closer to the island than was the previous forecast, its arrival at that point was forecast 72 hours away compared to about 36 hours in the earlier bulletin, thus the uncertainty was greater (farther into the future) and the possibility of a correct forecast was less.

The impact of forecast maximum winds on the wind threat is manifest by the wind threat derived from Warning 13 (1400 GMT 9 May). The cyclones forecast intensity was significantly reduced compared to the forecasts immediately preceeding and following. As a result, the threat to Sri Lanka dropped sharply as this was combined with a much more northward landfall forecast. That same dip is reflected for Tamil Nadu. In addition, we expected the track change to greatly increase the threat to Andhra Pradesh, but that was completely offset by the decreased wind forecast. We believe that the wind threat value is much more descriptive of the relative degree of threat than is the deterministic yes or no derived from the forecast.

POINT THREAT

Figure 5 illustrates the operation of an arbitrary set of rules keying an increasing degree of alertness simultaneously to an increasing threat of hurricane force winds and decreasing lead time as follows.

	P_{65}	within the next
1st Alert (Green)	> 2.5%	48 hours
2nd Alert (Yellow)	> 5.0%	48 hours
3rd Alert (Orange)	>10.0%	48 hours
4th Alert (Red)	>20.0%	24 hours

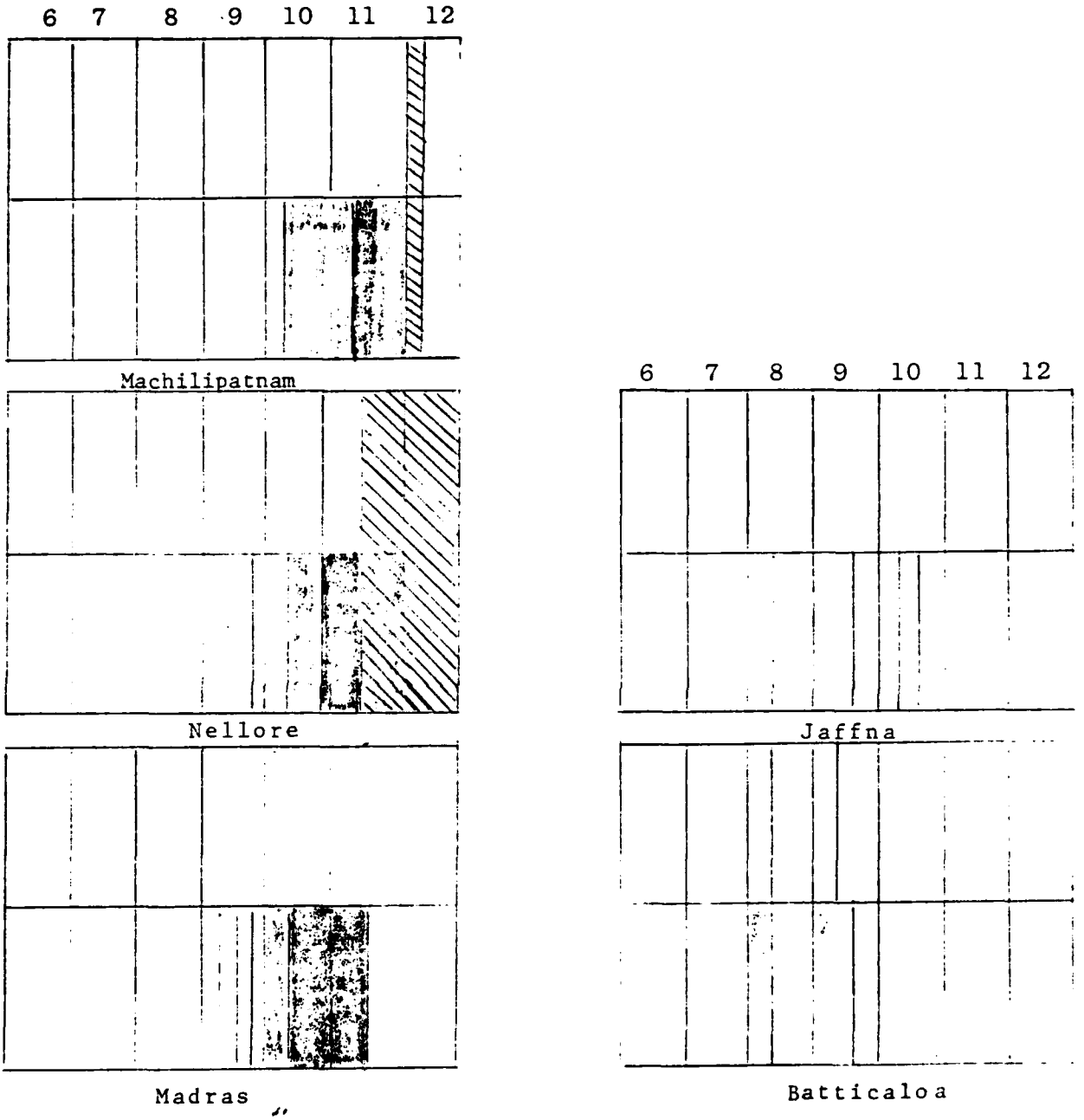


Figure 5. Color coded wind threat to selected cities from Cyclone 17-79.

Presumably first alert would be simply an admonition for the public to keep advised, officials would break out plans and go over them, but virtually no physical actions would be ordered.

The actions would increase until the fourth alert which would signal the point beyond which extensive preparations would be impossible, evacuation, if it were to be completed would in most cases have to be underway.

In figure 5 each small graph represents a coastal city. Times (dates GMT) are indicated across the top. The bottom half of the graph shows the color coded transition through the four alerts. The top half of the graph is shaded when the cyclone is forecast to pass within 100 nmi of the city within 36 hours. The cross hatched area represents the time when the cyclone was actually within 100 nmi of the city (based on figure 1).

We believe the evolution through the alerts to be orderly and timely. We would have hoped to see a few hours of red before the cyclone actually caused winds so strong as to stop preperations. This was not the case at Nellore. This is true because the forecast errors are so large in the Bay of Bengal. The probability around the forecast point is diluted so that the cyclone's future is known with reasonable confidence (error compared to the width of the destructive swath is small) only in very short range forecasts. Here we are assuming the winds extended 100 nmi from the cyclone center, or 20 hours (at 5 kts) before landfall. We expect a 20 hour forecast to have an error in excess of 100 nmi.

CONCLUSION

We believe the wind threat estimates were realistic and would have been useful in dealing with the disaster preparedness problem. In particular the area summed threat should be extremely valuable to alert disaster assistance forces as to the pending occurrence of a disaster within a broad region. The Point threats would be useful to guage the relative distribution of the threat in space, particularly with regard to population concentrations.

The Point threats could also be used directly by local government officials in considering what actions to order, and more specifically when to order such actions. It is noted that from this remote distance, the presence or absence of daylight, which is always an important consideration, is a constant source of confusion. Since this is a simple computation, it was added to the program output.

No other deficiencies were noted.

APPENDIX 1

This appendix contains copies of the computer output giving estimates of wind threats.

After-The Fact Runs: The output is described below:

Line 1: Printout of the input data - cyclone number, date-time group (Z=GMT), Latitude, Longitude, and maximum winds at forecast time, +24 hours and +48 hours. (48 at the end indicates 48 hours of forecast was given).

Lines 2 and 3: Self explanatory, events are strike or that winds of at least 40, 65 or 100 kts will be observed.

Line 4: Hours of darkness, (*) indicates dark. Darkness is assumed between 1800 and 0600 local and a -6 time zone was used. This is provided because darkness is such an important consideration in disaster potential evaluation.

Strike Lines: These are probabilities that the cyclone center will cross the coast within these areas.

Wind Lines: These are the probabilities that cyclone location, intensity and size will combine to cause winds of at least 40, 65, 100 kts to be observed at some point on the coast of these areas.

Map: This is a map of the outline of the Bay of Bengal. Each asterisk represents a point for which the wind threat is computed. These asterisks will be replaced in order by the letters G, Y, O, R as 65 kt wind threat (P65) increases according to the following rules.

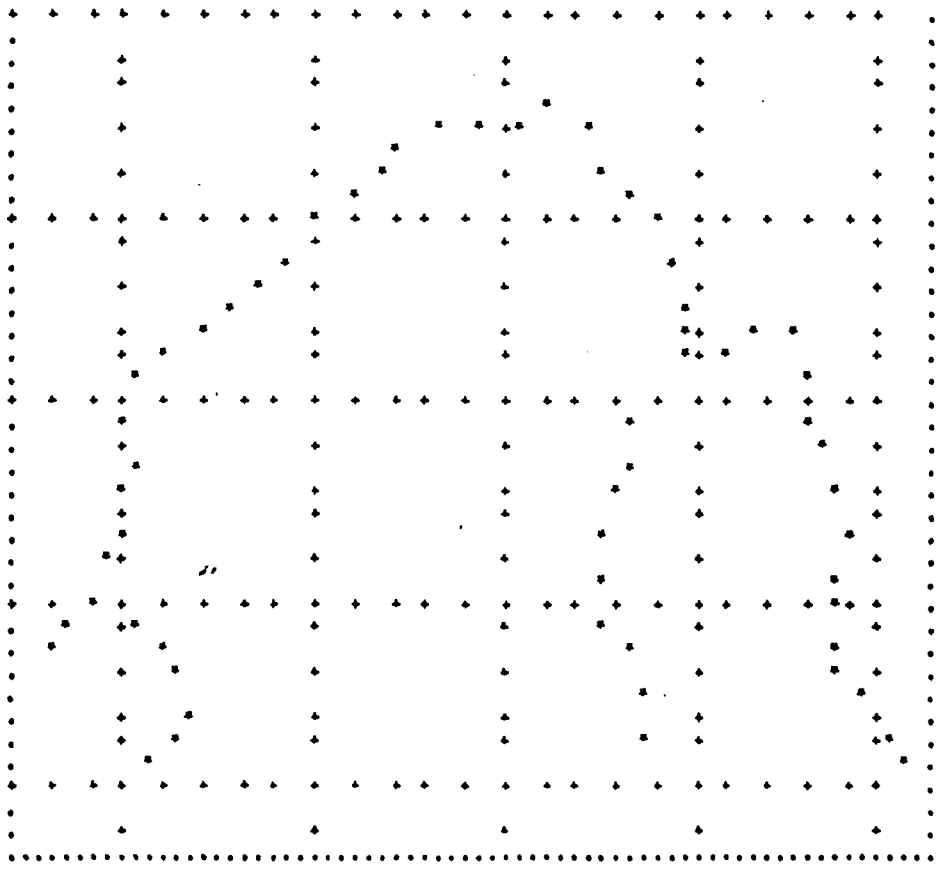
Symbol	P_{65}	Time Limitation
*	< 2.5%	None
G	> 2.5%	Within 48 hours
Y	> 5.0%	Within 48 hours
O	>10.0%	Within 36 hours
R	>20.0%	Within 24 hours

Real Time Runs:

Provided to OFDA separately are output from runs made in near real time. These are exact duplicates of the enclosed output copies except they do not contain the "hours of darkness" line, and they retain the GMT run time annotation affixed by the Fleet Numerical Weather Central's Computer Center.

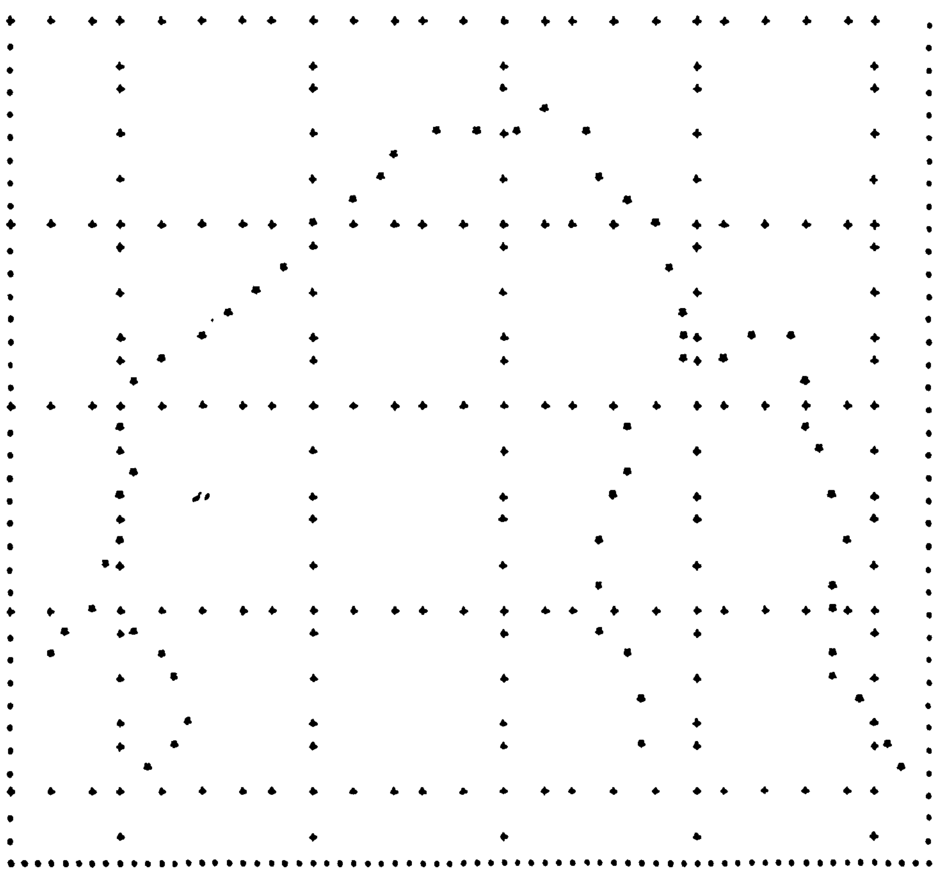
17-79 110614037 72N 477E 30K 47N 858E 35K 111N 946E 45K 44
FOR CYCLONE 17-79 FROM 7614037
PROBABILITIES OF EVENTS WITHIN 24HRS 12HRS 24HRS 36HRS 48HRS
HOURS OF DARKNESS ***** * ***** * *****

STRIKE WITHIN SRI LANKA	0.701	.701	.724	.789	.147
WINDS OF AT LEAST 40KNOTS	0.000	.001	.009	.041	.041
WINDS OF AT LEAST 65KNOTS	0.000	.001	.001	.004	.013
WINDS OF AT LEAST 100KNOTS	0.000	.001	0.000	.000	.000
STRIKE WITHIN TAMIL NADU	0.000	0.000	.000	.016	.065
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.000	.008	.041
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.001	.008
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.000
STRIKE WITHIN AN PRADESH	0.000	0.000	0.000	.001	.020
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.000	.012
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.003
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	.000	.017	.086
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.000	.004	.047
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.001	.011
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.000
STRIKE WITHIN AN ISLANDS	0.000	0.000	.001	.002	.003
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.000	.001	.001
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000



17-79 11062?0?7 74N 975E ?0K 9?N ?55E 35K 10?N ?41E 45K 48
FOR CYCLONE 17-79 FROM 062?0?7

PROBABILITIES OF EVENTS WITHIN	0HRS	12HRS	24HRS	36HRS	48HRS
HOURS OF DARKNESS	++	+	***++	+	****+*
STRIKE WITHIN SRI LANKA	0.000	.001	.032	.109	.176
WINDS OF AT LEAST 40KNOTS	0.000	.000	.011	.050	.096
WINDS OF AT LEAST 65KNOTS	0.000	.000	.001	.005	.014
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN TAMIL NADU	0.000	0.000	.001	.024	.095
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.000	.012	.059
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.001	.012
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN AN PRADESH	0.000	0.000	0.000	.002	.035
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.001	.020
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.005
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN ORSA+W.BEN	0.000	0.000	0.000	0.000	.001
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.000	.000
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	.001	.025	.130
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.000	.012	.071
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.002	.016
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN AN ISLANDS	0.000	0.000	.000	.001	.002
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.000	.001	.001
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.000



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17-79 110703Z07  79N 882E  35K  86N 882E  45K 112N 887E  55K 48
FOR CYCLONE 17-79 FROM 070300Z
PROBABILITIES OF EVENTS WITHIN   0HRS 12HRS 24HRS 36HRS 48HRS
            HOURS OF DARKNESS    +    *+***** +    *+***** +    *

  STRIKE WITHIN SRI LANKA      0.000 0.000  .001  .004  .021
   WINDS OF AT LEAST  40KNOTS 0.000 0.000  .001  .006  .017
   WINDS OF AT LEAST  65KNOTS 0.000 0.000  .000  .001  .005
   WINDS OF AT LEAST 100KNOTS 0.000 0.000  .000  .000  .000

  STRIKE WITHIN TAMIL NADU     0.000 0.000 0.000  .001  .005
   WINDS OF AT LEAST  40KNOTS 0.000 0.000 0.000  .001  .005
   WINDS OF AT LEAST  65KNOTS 0.000 0.000 0.000  .000  .002
   WINDS OF AT LEAST 100KNOTS 0.000 0.000 0.000  .000  .000

  STRIKE WITHIN AN PRADESH     0.000 0.000 0.000  .000  .004
   WINDS OF AT LEAST  40KNOTS 0.000 0.000 0.000  .000  .004
   WINDS OF AT LEAST  65KNOTS 0.000 0.000 0.000  .000  .001
   WINDS OF AT LEAST 100KNOTS 0.000 0.000 0.000  .000  .000

  STRIKE WITHIN ORISSA+W.BEN   0.000 0.000 0.000 0.000  .001
   WINDS OF AT LEAST  40KNOTS 0.000 0.000 0.000 0.000  .001
   WINDS OF AT LEAST  65KNOTS 0.000 0.000 0.000 0.000  .000
   WINDS OF AT LEAST 100KNOTS 0.000 0.000 0.000 0.000  .000

  STRIKE WITHIN EAST INDIA     0.000 0.000 0.000  .001  .010
   WINDS OF AT LEAST  40KNOTS 0.000 0.000 0.000  .001  .007
   WINDS OF AT LEAST  65KNOTS 0.000 0.000 0.000  .000  .003
   WINDS OF AT LEAST 100KNOTS 0.000 0.000 0.000  .000  .000

  STRIKE WITHIN BURMA          0.000 0.000 0.000  .000  .001
   WINDS OF AT LEAST  40KNOTS 0.000 0.000 0.000  .000  .001
   WINDS OF AT LEAST  65KNOTS 0.000 0.000 0.000  .000  .000
   WINDS OF AT LEAST 100KNOTS 0.000 0.000 0.000  .000  .000

  STRIKE WITHIN AN ISLANDS     0.000  .001  .016  .046  .066
   WINDS OF AT LEAST  40KNOTS 0.000  .000  .009  .031  .049
   WINDS OF AT LEAST  65KNOTS 0.000  .000  .001  .006  .012
   WINDS OF AT LEAST 100KNOTS 0.000 0.000 0.000  .000  .000
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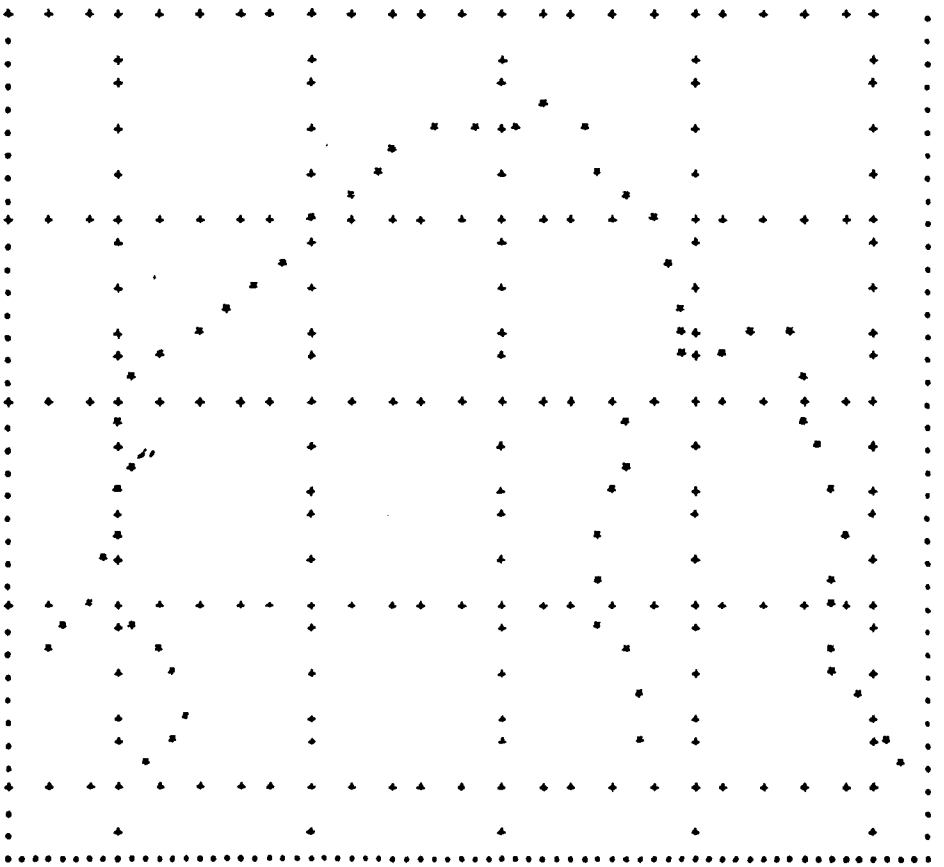


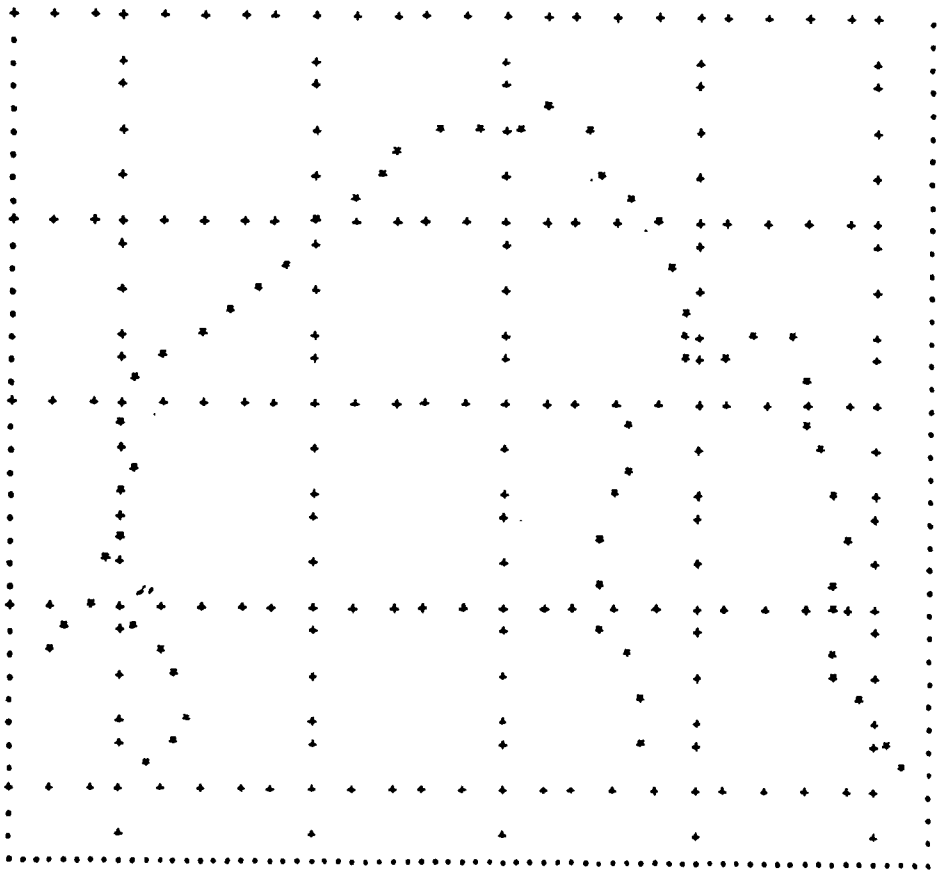
17-79 110700Z7 7?N 877E 36K 87N 875E 45K 105N 8?2E 55K 48

FOR CYCLONE 17-79 FROM 27C4CE7

PROBABILITIES OF EVENTS WITHIN 6HRS 12HRS 24HRS 36HRS 48HRS

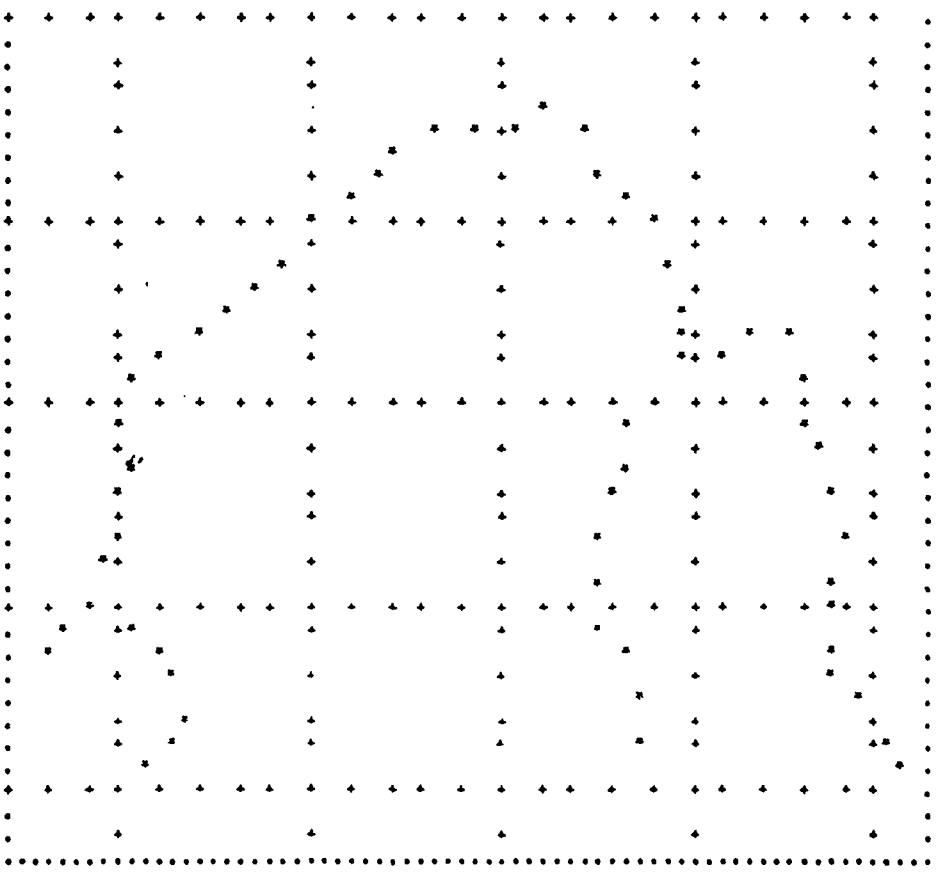
HOURS OF DARKNESS + ***** + ***** + ***

STRIKE WITHIN SRI LANKA	0.000	0.000	.004	.021	.045
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.003	.015	.035
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.003	.010
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.000
STRIKE WITHIN TAMIL NADU	0.000	0.000	0.000	.001	.008
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.001	.007
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.002
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN AN PRADESH	0.000	0.000	0.000	.000	.004
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.000	.004
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.001
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	0.000	.001	.012
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.001	.009
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.003
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN AN ISLANDS	0.000	.000	.006	.023	.038
WINDS OF AT LEAST 40KNOTS	0.000	.000	.003	.015	.027
WINDS OF AT LEAST 65KNOTS	0.000	.000	.000	.003	.007
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.000	.000



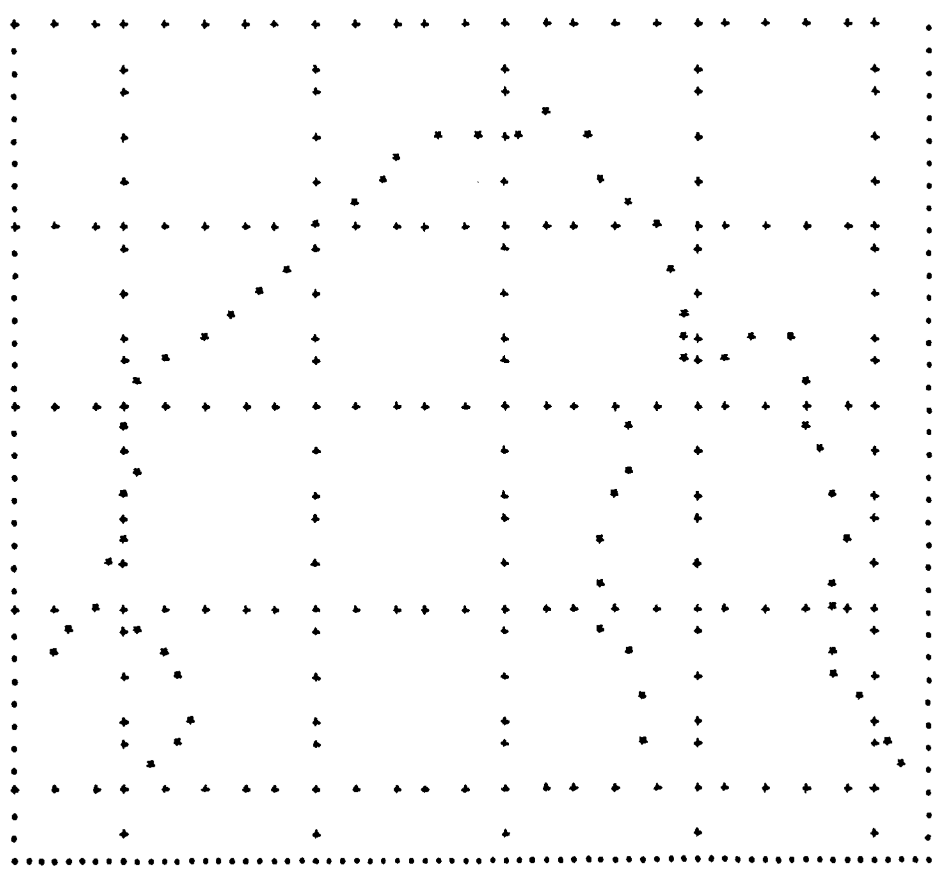
17-79 110714007 76N 871E 40K 99N 879E 50K 120N 890E 65K 48
FOR CYCLONE 17-79 FROM 0714007
PROBABILITIES OF EVENTS WITHIN 0HRS 12HRS 24HRS 36HRS 48HRS
HOURS OF DARKNESS +***** + +***** + +*****

STRIKE WITHIN SRI LANKA	0.000	0.000	.002	.019	.018
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.002	.008	.017
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.002	.006
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.000
STRIKE WITHIN TAMIL NADU	0.000	0.000	0.000	.001	.005
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.001	.006
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.002
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN AN PRADESH	0.000	0.000	0.000	.000	.006
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.000	.007
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.003
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN ORSA+W.BEN	0.000	0.000	0.000	0.000	.002
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.000	.002
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.000	.001
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	0.000	.001	.013
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.001	.011
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.006
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN BURMA	0.000	0.000	0.000	.000	.002
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.000	.002
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.001
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN AN ISLANDS	0.000	.000	.009	.036	.059
WINDS OF AT LEAST 40KNOTS	0.000	.000	.006	.030	.053
WINDS OF AT LEAST 65KNOTS	0.000	.000	.001	.008	.019
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.000	.000



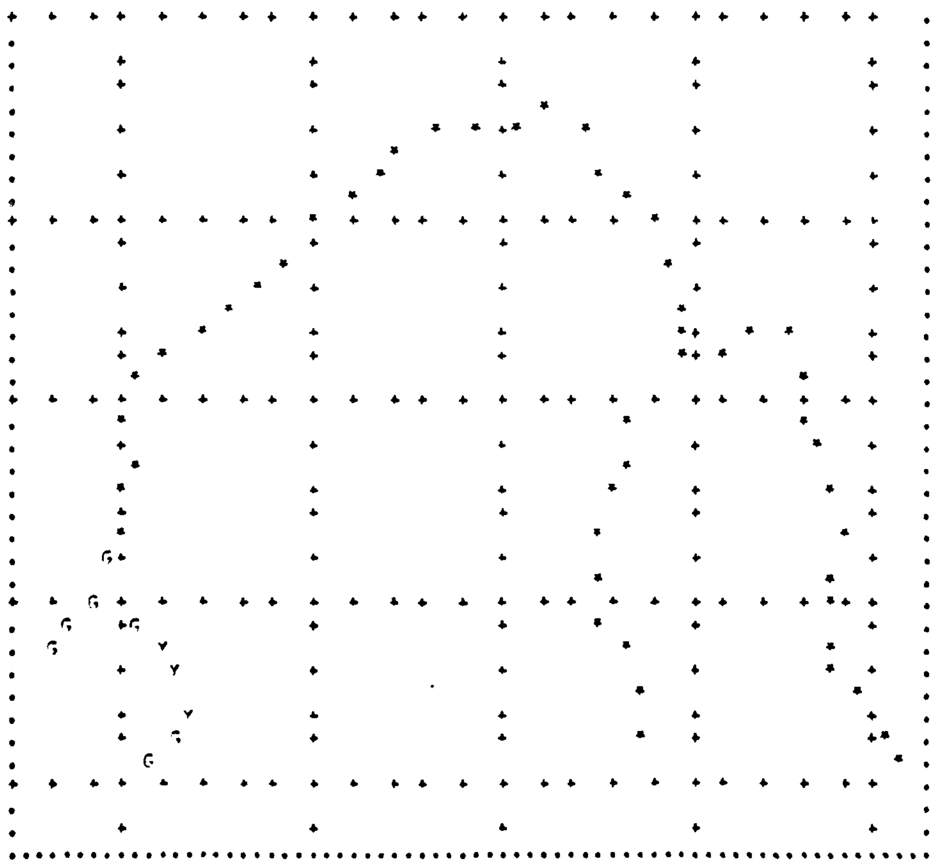
17-79 11072200Z 75N 866E 45K 95N 858E 60K 115N 867E 70K 48
FOR CYCLONE 17-79 FROM 1722002Z

PROBABILITIES OF EVENTS WITHIN	12HRS	12HRS	24HRS	36HRS	48HRS
HOURS OF DARKNESS	**	*	*****	*	*****
STRIKE WITHIN SRI LANKA	0.000	.012	.024	.073	.136
WINDS OF AT LEAST 40KNOTS	0.000	.011	.027	.072	.115
WINDS OF AT LEAST 65KNOTS	0.000	.000	.008	.028	.050
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.002
STRIKE WITHIN TAMIL NADU	0.000	0.000	.001	.015	.045
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.001	.015	.051
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.007	.025
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.002
STRIKE WITHIN AN PRADESH	0.000	0.000	0.000	.002	.024
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.004	.032
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.001	.014
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.001
STRIKE WITHIN ORSA+W.BEN	0.000	0.000	0.000	0.000	.002
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.000	.003
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.000	.001
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	.001	.017	.071
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.001	.015	.065
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.008	.038
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.003
STRIKE WITHIN AN ISLANDS	0.000	0.000	.000	.003	.006
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.000	.003	.006
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.001	.003
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.000



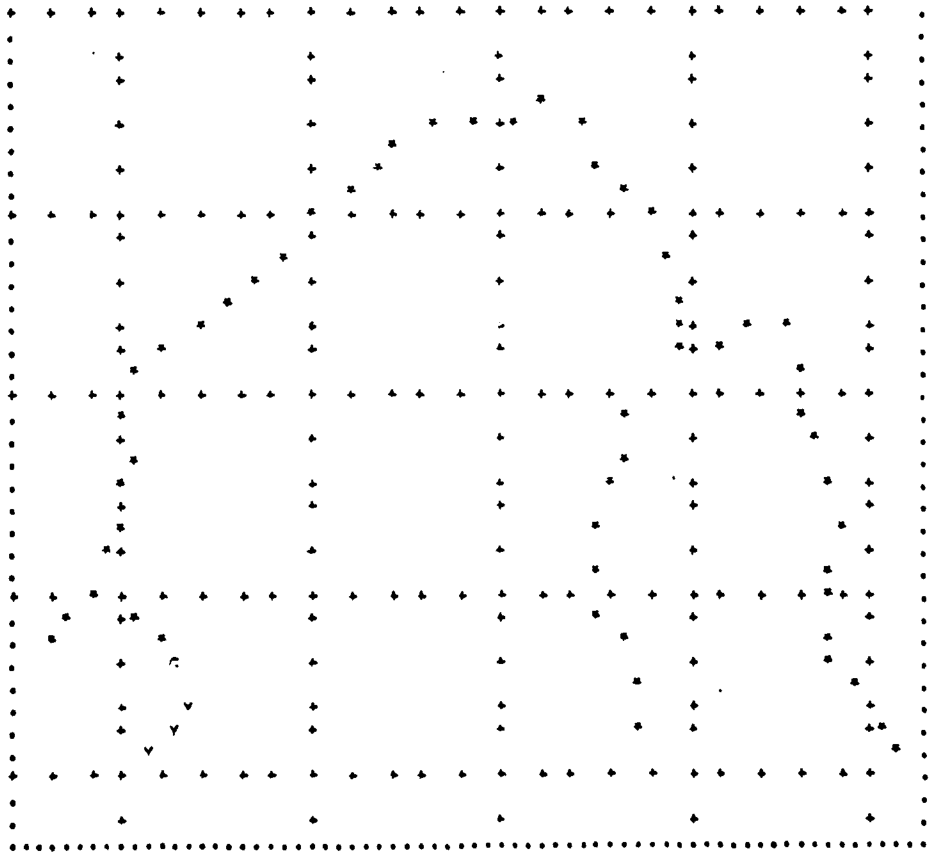
17-79 110812007 69N 868E 50K 76N 832E 60K 85N 810E 55K 4A
FOR CYCLONE 17-79 FROM [illegible]
PROBABILITIES OF EVENTS WITHIN 0HRS 12HRS 24HRS 36HRS 48HRS
HOURS OF DARKNESS + ***** + ***** +

	0HRS	12HRS	24HRS	36HRS	48HRS
STRIKE WITHIN SRI LANKA	0.000	.015	.132	.359	.461
WINDS OF AT LEAST 40KNOTS	0.000	.014	.159	.351	.456
WINDS OF AT LEAST 65KNOTS	0.000	.003	.055	.129	.174
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.012	.003
STRIKE WITHIN TAMIL NADU	0.000	0.000	.004	.074	.204
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.004	.066	.184
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.002	.029	.093
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.001	.004
STRIKE WITHIN AN PRADESH	0.000	0.000	0.000	.001	.018
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.004	.029
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.001	.007
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	.004	.075	.221
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.004	.066	.188
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.002	.029	.098
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.001	.004



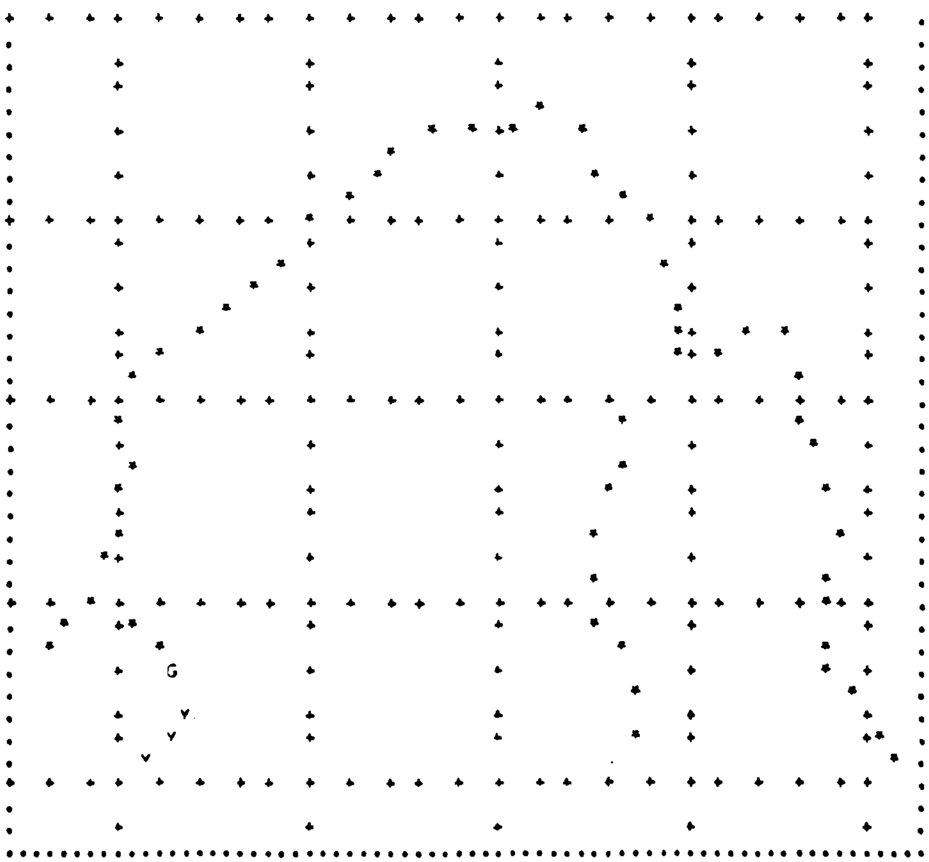
17-79 [illegible] 56N [illegible] 60K [illegible] 55K [illegible] 70K [illegible]
FOR CYCLONE 17-79 FROM [illegible]
PROBABILITIES OF EVENTS WITHIN 0HRS 12HRS 24HRS 36HRS 48HRS
HOURS OF DARKNESS + ****+* + ****+* + ***

	0HRS	12HRS	24HRS	36HRS	48HRS
STRIKE WITHIN SRI LANKA	0.000	.003	.071	.190	.230
WINDS OF AT LEAST 40KNOTS	0.000	.003	.068	.182	.235
WINDS OF AT LEAST 65KNOTS	0.000	.001	.033	.098	.159
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.003	.009
STRIKE WITHIN TAMIL NADU	0.000	0.000	0.000	.004	.040
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.004	.038
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.002	.023
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.002
STRIKE WITHIN AN PRADESH	0.000	0.000	0.000	0.000	.001
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.000	.001
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	0.000	.004	.041
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.004	.039
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.002	.024
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.002



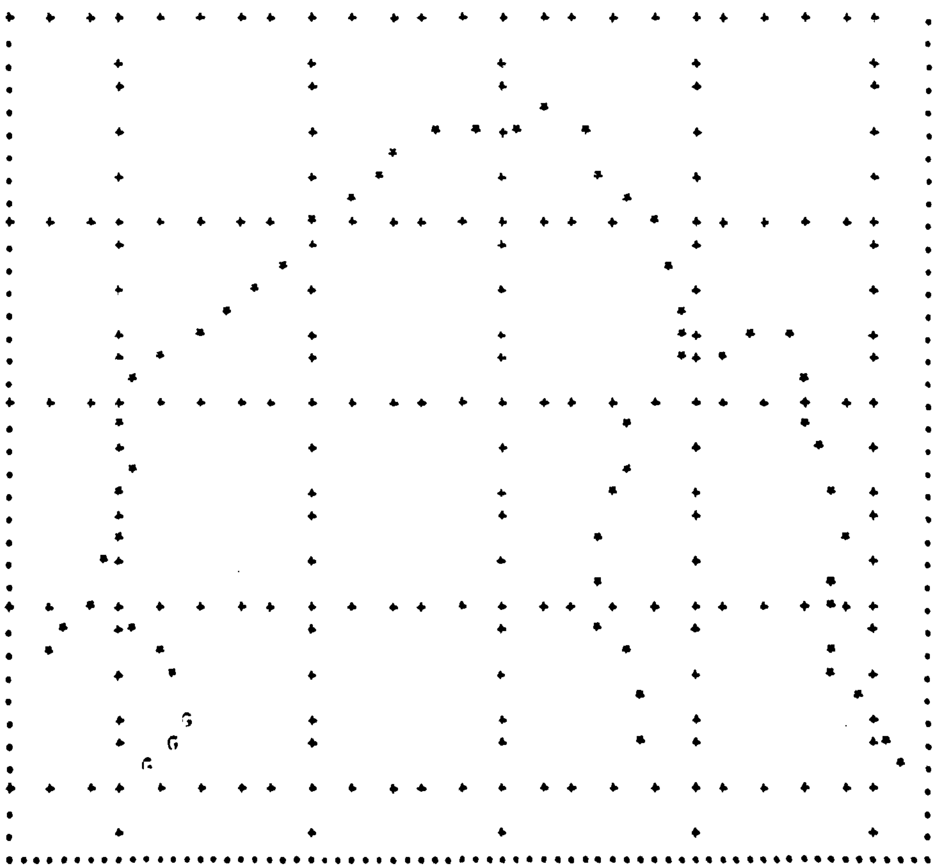
17-79 110914Z07 60N 355E 60K 49N 324E 65K 53N 792E 70K 4A
FOR CYCLONE 17-79 FROM 110914Z07
PROBABILITIES OF EVENTS WITHIN 6HRS 12HRS 24HRS 36HRS 48HRS
HOURS OF DARKNESS ***** + ***** + *****

	6HRS	12HRS	24HRS	36HRS	48HRS
STRIKE WITHIN SRI LANKA	0.000	.015	.179	.263	.349
WINDS OF AT LEAST 40KNOTS	0.000	.015	.133	.259	.342
WINDS OF AT LEAST 65KNOTS	0.000	.006	.065	.135	.185
WINDS OF AT LEAST 100KNOTS	0.000	.000	.001	.003	.007
STRIKE WITHIN TAMIL NADU	0.000	0.000	.000	.008	.049
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.000	.008	.046
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.004	.029
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.003
STRIKE WITHIN AN PRADESH	0.000	0.000	0.000	0.000	.001
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.000	.002
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	.000	.008	.050
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.000	.008	.046
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.004	.029
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.003



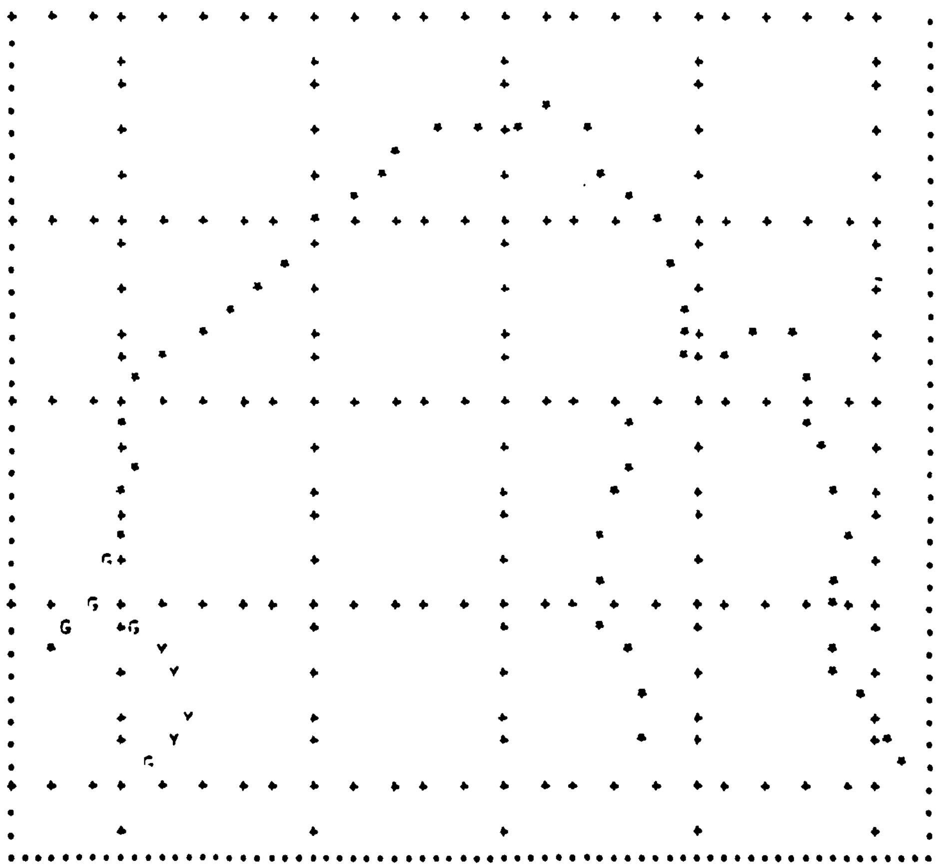
17-79 11382C017 59N 862E 60K 57N 858E 65K 54N 840E 70K 48
FOR CYCLONE 17-79 FROM 1382C017

PROBABILITIES OF EVENTS WITHIN	6HRS	12HRS	24HRS	36HRS	48HRS
HOURS OF DARKNESS	**	*	*****	*	*****
STRIKE WITHIN SRI LANKA	0.000	.001	.024	.070	.125
WINDS OF AT LEAST 40KNOTS	0.000	.001	.023	.068	.125
WINDS OF AT LEAST 65KNOTS	0.000	.000	.011	.037	.071
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.001	.005
STRIKE WITHIN TAMIL NADU	0.000	0.000	0.000	.001	.016
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.001	.015
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.001	.009
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.001
STRIKE WITHIN AN PRADESH	0.000	0.000	0.000	0.000	.000
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.000	.001
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	0.000	.001	.016
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.001	.015
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.001	.009
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.001
STRIKE WITHIN AN ISLANDS	0.000	0.000	0.000	.000	.001
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.000	.000
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000



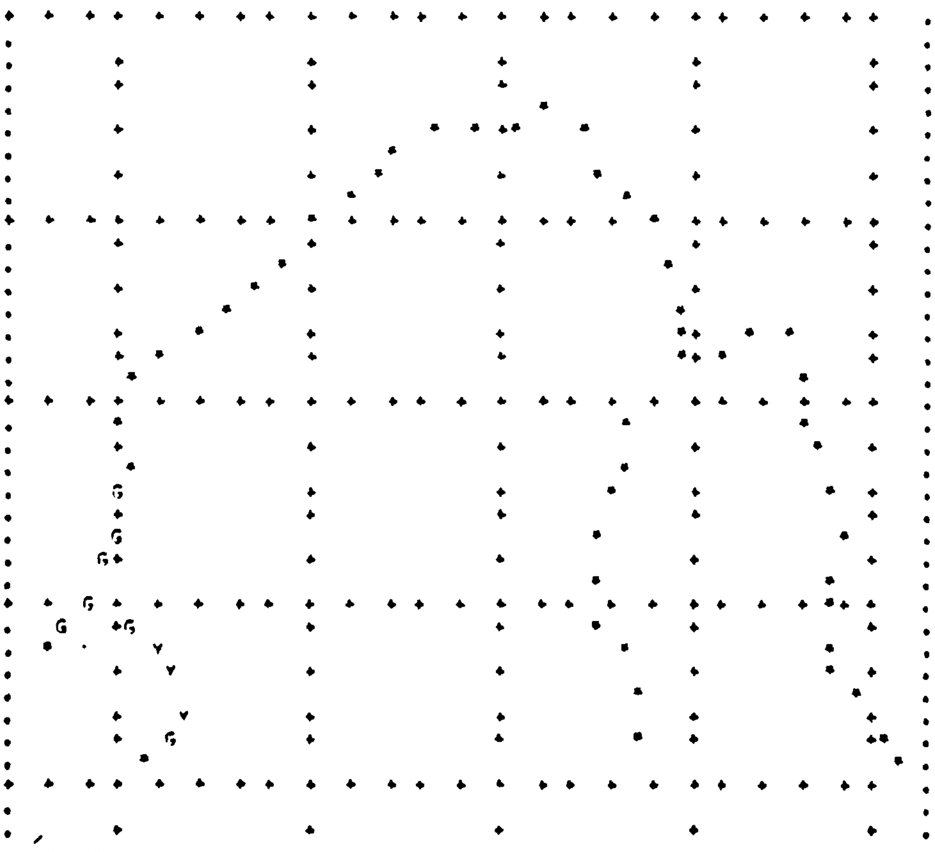
17-79 11030200Z 73N 862E 65K 12N 842E 70K 90N 815E 65K 48
FOR CYCLONE 17-79 FROM 03020Z
PROBABILITIES OF EVENTS WITHIN 0HRS 12HRS 24HRS 36HRS 48HRS
HOURS OF DARKNESS + +++++ + +++++ +

	0HRS	12HRS	24HRS	36HRS	48HRS
STRIKE WITHIN SRI LANKA	0.000	.006	.098	.231	.333
WINDS OF AT LEAST 40KNOTS	0.000	.006	.102	.255	.372
WINDS OF AT LEAST 65KNOTS	0.000	.003	.061	.142	.137
WINDS OF AT LEAST 100KNOTS	0.000	.000	.001	.006	.011
STRIKE WITHIN TAMIL NADU	0.000	0.000	.003	.051	.165
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.003	.050	.167
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.002	.030	.092
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.002	.007
STRIKE WITHIN AN PRADESH	0.000	0.000	0.000	.002	.024
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.005	.038
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.001	.013
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.001
STRIKE WITHIN EAST INDIA	0.000	0.000	.003	.053	.189
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.003	.050	.173
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.002	.031	.101
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.002	.008



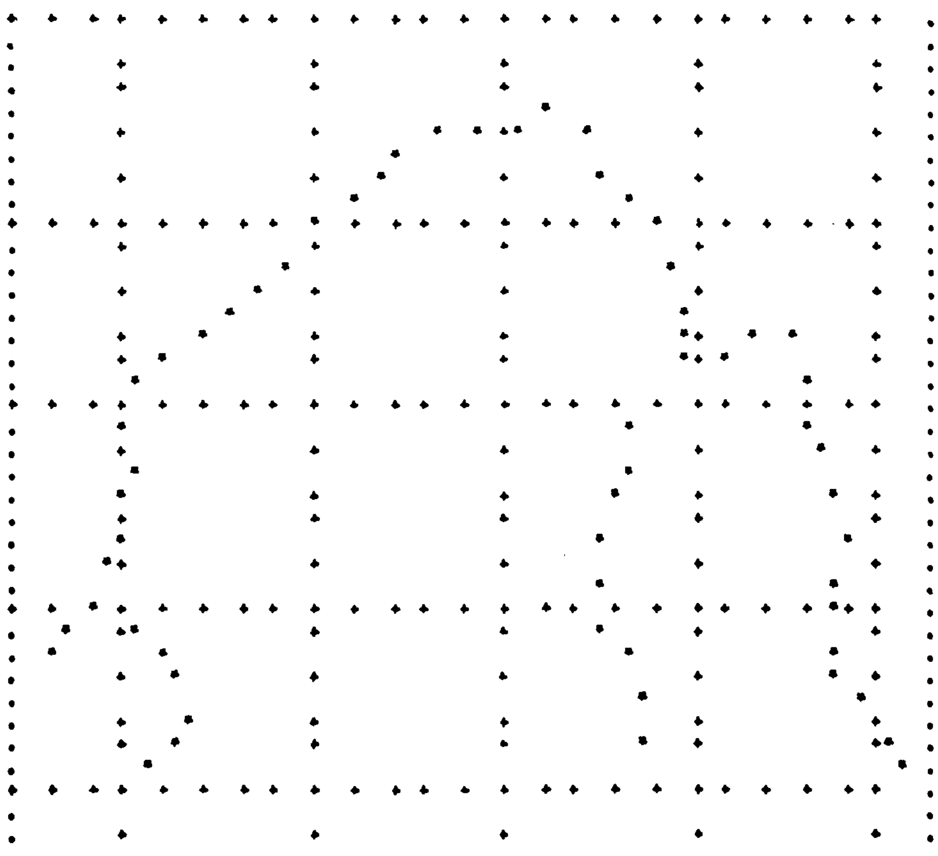
17-79 1119024337 73N 858E 55K 90N 841E 70K 103N 815E 65K 48
FOR CYCLONE 17-79 FROM 1902337
PROBABILITIES OF EVENTS WITHIN 0HRS 12HRS 24HRS 36HRS 48HRS
HOURS OF DARKNESS * ***** * ***** * ***

STRIKE WITHIN SRI LANKA	0.000	.009	.035	.205	.288
WINDS OF AT LEAST 40KNOTS	0.000	.039	.105	.240	.339
WINDS OF AT LEAST 65KNOTS	0.000	.005	.059	.123	.174
WINDS OF AT LEAST 100KNOTS	0.000	.000	.001	.005	.009
STRIKE WITHIN TAMIL NADU	0.000	0.000	.005	.079	.206
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.005	.080	.218
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.004	.048	.117
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.003	.009
STRIKE WITHIN AN PRADESH	0.000	0.000	0.000	.006	.051
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.013	.073
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.003	.027
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.002
STRIKE WITHIN ORSA+W.BEN	0.000	0.000	0.000	0.000	.000
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	0.000	.001
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	0.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	0.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	.005	.095	.257
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.006	.081	.236
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.004	.049	.138
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.003	.011



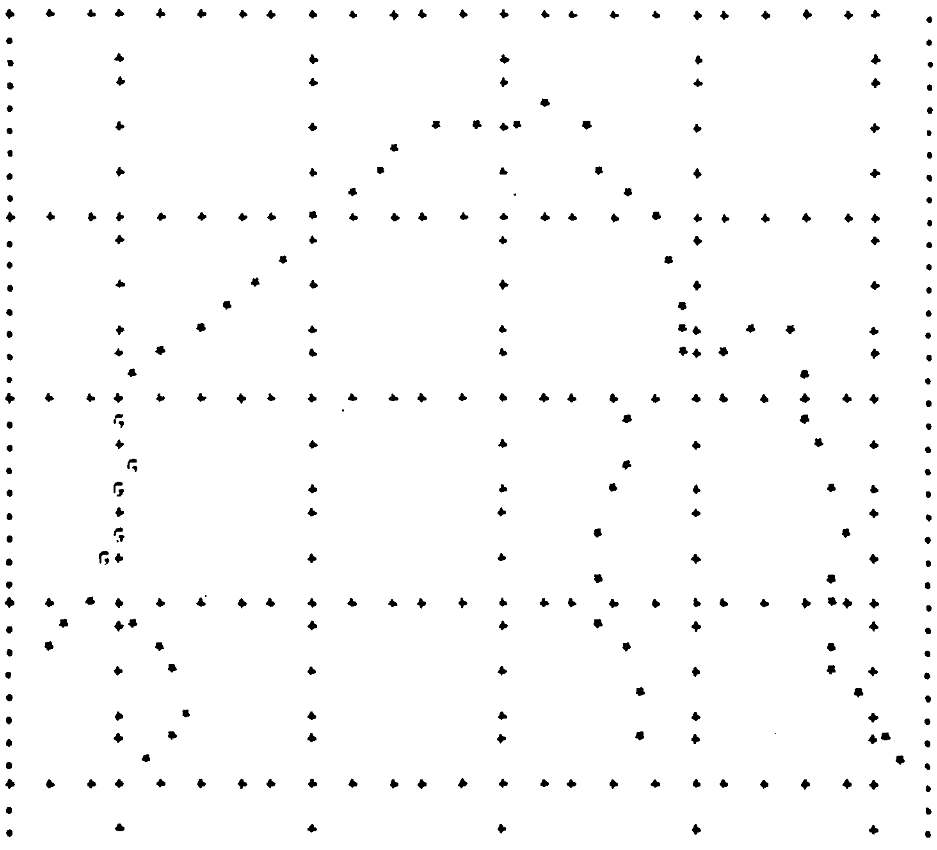
17-79 11091400Z 88N 356E 50K 104N 875E 55K 119N 812E 50K 48
FOR CYCLONE 17-79 FROM 091400Z
PROBABILITIES OF EVENTS WITHIN 0HRS 12HRS 24HRS 36HRS 48HRS
HOURS OF DARKNESS ***** * ***** * *****

	0HRS	12HRS	24HRS	36HRS	48HRS
STRIKE WITHIN SRI LANKA	0.000	.008	.173	.133	.191
WINDS OF AT LEAST 40KNOTS	0.000	.009	.180	.143	.138
WINDS OF AT LEAST 65KNOTS	0.000	.072	.121	.039	.050
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.000	.001
STRIKE WITHIN TAMIL NADU	0.000	0.000	.130	.145	.254
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.027	.131	.222
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.009	.039	.067
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.001
STRIKE WITHIN AN PRADESH	0.000	0.000	.001	.032	.116
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.004	.045	.120
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.008	.029
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.001
STRIKE WITHIN ORSA+W.BEN	0.000	0.000	0.000	.000	.002
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.000	.003
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.000
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN EAST INDIA	0.000	0.000	.031	.178	.371
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.027	.142	.276
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.008	.046	.093
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.001	.002



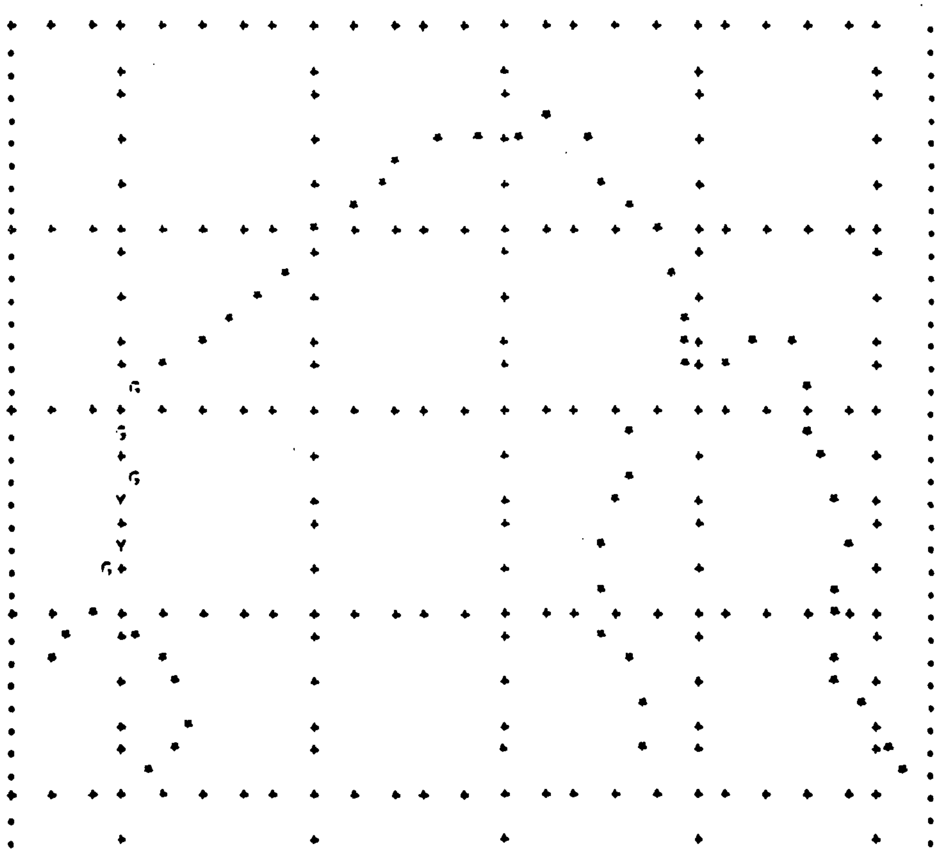
17-79 11092000Z 13.4N 85.3E 60K 12.3N 83.7E 60K 13.0N 83.3E 55K 48
FOR CYCLONE 17-79 FROM 092000Z
PROBABILITIES OF EVENTS WITHIN 0HRS 12HRS 24HRS 36HRS 48HRS
HOURS OF DARKNESS ** * ***** * *****

STRIKE WITHIN SRI LANKA	0.000	.002	.014	.031	.049
WINDS OF AT LEAST 40KNOTS	0.000	.003	.027	.046	.064
WINDS OF AT LEAST 65KNOTS	0.000	.001	.005	.013	.019
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.000	.000
STRIKE WITHIN TAMIL NADU	0.000	.003	.081	.177	.237
WINDS OF AT LEAST 40KNOTS	0.000	.003	.095	.205	.263
WINDS OF AT LEAST 65KNOTS	0.000	.001	.032	.070	.090
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.001	.002
STRIKE WITHIN AN PRADESH	0.000	.000	.029	.125	.203
WINDS OF AT LEAST 40KNOTS	0.000	.001	.051	.154	.228
WINDS OF AT LEAST 65KNOTS	0.000	.000	.011	.045	.070
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.001	.002
STRIKE WITHIN ORSA+W.BEN	0.000	0.000	0.000	.001	.004
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.002	.009
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.001
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN EAST INDIA	0.000	.003	.110	.303	.444
WINDS OF AT LEAST 40KNOTS	0.000	.003	.132	.266	.373
WINDS OF AT LEAST 65KNOTS	0.000	.001	.040	.108	.153
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.002	.004



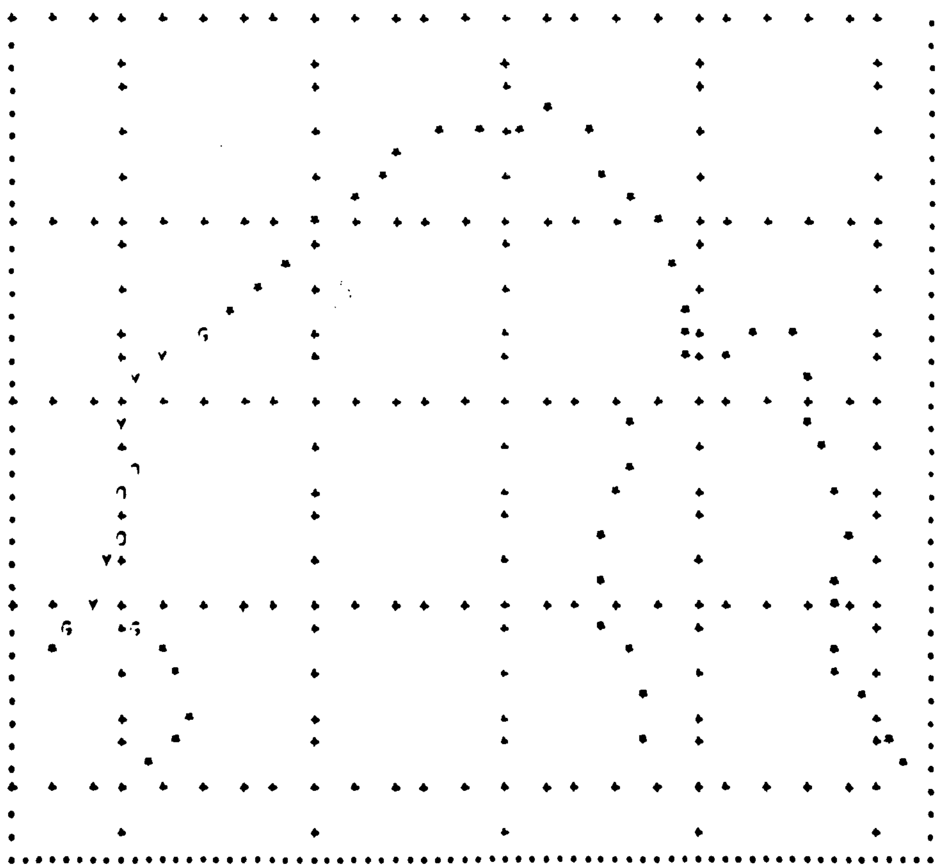
17-79 111002037 109N 843E 65K 123N 818E 60K 130N 800E 60K 48
FOR CYCLONE 17-79 FROM 1002037

PROBABILITIES OF EVENTS WITHIN	0HRS	12HRS	24HRS	36HRS	48HRS
HOURS OF DARKNESS	*	*****	*	*****	*
STRIKE WITHIN SRI LANKA	0.000	.003	.014	.028	.041
WINDS OF AT LEAST 40KNOTS	0.000	.005	.025	.045	.061
WINDS OF AT LEAST 65KNOTS	0.000	.001	.007	.013	.019
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.000	.000
STRIKE WITHIN TAMIL NADU	0.000	.015	.142	.235	.288
WINDS OF AT LEAST 40KNOTS	0.000	.018	.173	.292	.337
WINDS OF AT LEAST 65KNOTS	0.000	.008	.062	.101	.124
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.001	.003
STRIKE WITHIN AN PRADESH	0.000	.002	.058	.158	.221
WINDS OF AT LEAST 40KNOTS	0.000	.007	.099	.208	.270
WINDS OF AT LEAST 65KNOTS	0.000	.001	.023	.061	.088
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.001	.003
STRIKE WITHIN ORSA+W.BEN	0.000	0.000	0.000	.001	.003
WINDS OF AT LEAST 40KNOTS	0.000	0.000	0.000	.002	.006
WINDS OF AT LEAST 65KNOTS	0.000	0.000	0.000	.000	.001
WINDS OF AT LEAST 100KNOTS	0.000	0.000	0.000	.000	.000
STRIKE WITHIN EAST INDIA	0.000	.018	.200	.394	.512
WINDS OF AT LEAST 40KNOTS	0.000	.018	.187	.355	.451
WINDS OF AT LEAST 65KNOTS	0.000	.008	.079	.153	.201
WINDS OF AT LEAST 100KNOTS	0.000	.000	.001	.003	.006



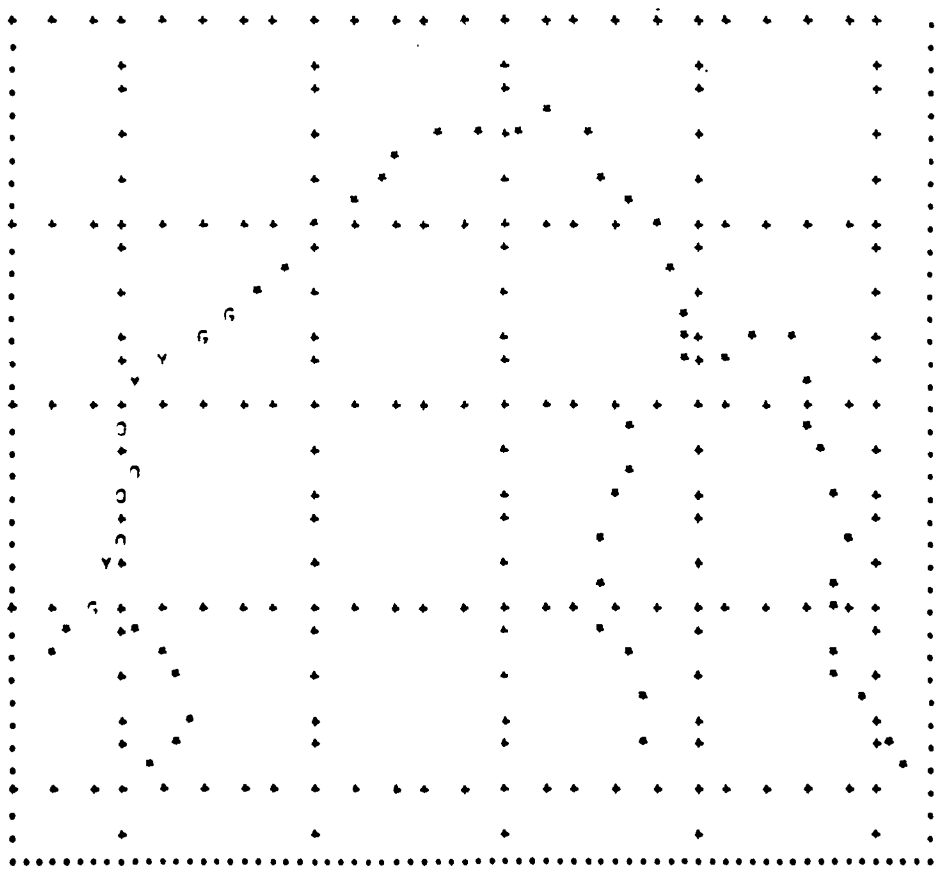
17-79 11110807 116N 870E 75K 125N 847E 85K 131N 794E 55K 48
FOR CYCLONE 17-79 FROM 11110807
PROBABILITIES OF EVENTS WITHIN 0HRS 12HRS 24HRS 36HRS 48HRS
HOURS OF DARKNESS + *****+ + *****+ + ***

		0HRS	12HRS	24HRS	36HRS	48HRS
STRIKE WITHIN SRI LANKA		0.000	.001	.008	.019	.029
WINDS OF AT LEAST	40KNOTS	0.000	.003	.020	.043	.062
WINDS OF AT LEAST	65KNOTS	0.000	.001	.010	.022	.032
WINDS OF AT LEAST	100KNOTS	0.000	.000	.001	.003	.005
STRIKE WITHIN TAMIL NADU		0.000	.031	.162	.252	.306
WINDS OF AT LEAST	40KNOTS	0.000	.042	.256	.377	.455
WINDS OF AT LEAST	65KNOTS	0.000	.032	.170	.260	.309
WINDS OF AT LEAST	100KNOTS	0.000	.001	.016	.035	.049
STRIKE WITHIN AN PRADESH		0.000	.007	.099	.194	.258
WINDS OF AT LEAST	40KNOTS	0.000	.021	.152	.358	.444
WINDS OF AT LEAST	65KNOTS	0.000	.006	.080	.173	.226
WINDS OF AT LEAST	100KNOTS	0.000	.000	.010	.032	.048
STRIKE WITHIN ORSA+W.BEN		0.000	0.000	0.000	.001	.002
WINDS OF AT LEAST	40KNOTS	0.000	0.000	0.000	.009	.017
WINDS OF AT LEAST	65KNOTS	0.000	0.000	0.000	.001	.002
WINDS OF AT LEAST	100KNOTS	0.000	0.000	0.000	.000	.001
STRIKE WITHIN EAST INDIA		0.000	.039	.251	.447	.566
WINDS OF AT LEAST	40KNOTS	0.000	.039	.250	.446	.563
WINDS OF AT LEAST	65KNOTS	0.000	.033	.224	.396	.493
WINDS OF AT LEAST	100KNOTS	0.000	.001	.026	.067	.098



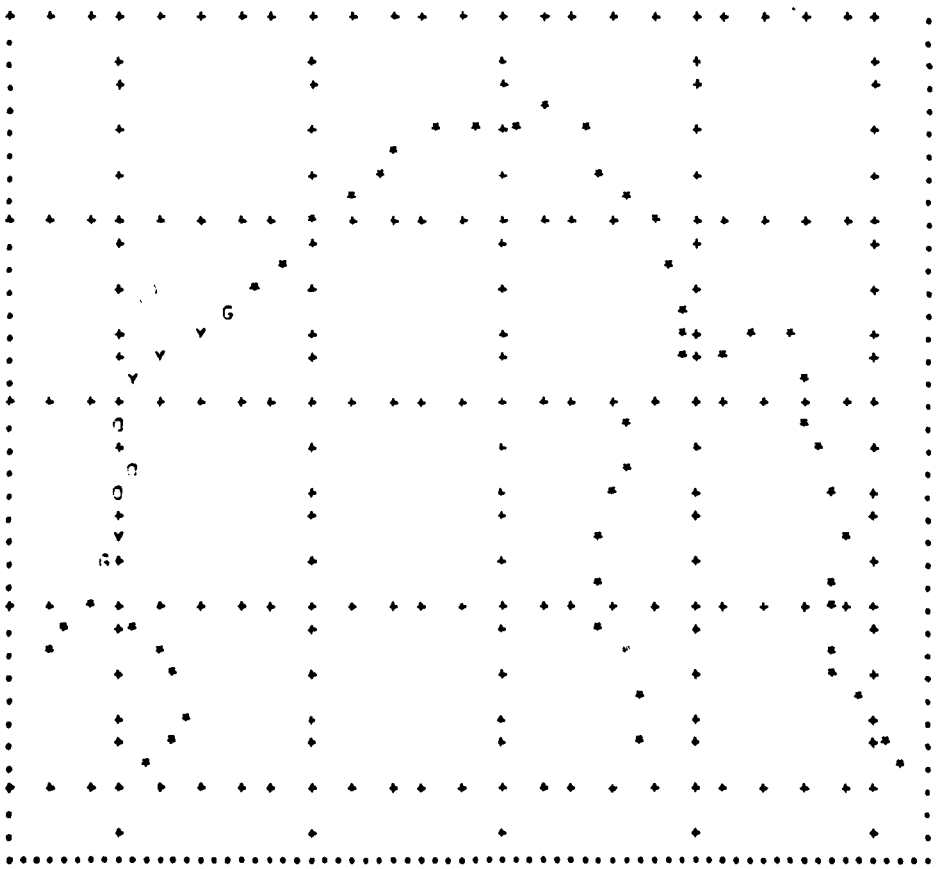
17-79 1114002 12.1N 83.4E 75K 13.7N 81.2E 85K 14.0N 79.4E 60K 48
FOR CYCLONE 17-79 FROM 111400Z

PROBABILITIES OF EVENTS WITHIN	0HRS	12HRS	24HRS	36HRS	48HRS
HOURS OF DARKNESS	*****	*	*****	*	*****
STRIKE WITHIN SRI LANKA	0.000	.000	.002	.006	.011
WINDS OF AT LEAST 40KNOTS	0.000	.001	.006	.015	.024
WINDS OF AT LEAST 65KNOTS	0.000	.000	.003	.007	.012
WINDS OF AT LEAST 100KNOTS	0.000	.000	.000	.001	.002
STRIKE WITHIN TAMIL NADU	0.000	.046	.145	.209	.249
WINDS OF AT LEAST 40KNOTS	0.000	.094	.290	.388	.450
WINDS OF AT LEAST 65KNOTS	0.000	.051	.159	.224	.260
WINDS OF AT LEAST 100KNOTS	0.000	.002	.012	.026	.037
STRIKE WITHIN AN PRADESH	0.000	.027	.156	.275	.337
WINDS OF AT LEAST 40KNOTS	0.000	.054	.229	.369	.517
WINDS OF AT LEAST 65KNOTS	0.000	.023	.140	.245	.297
WINDS OF AT LEAST 100KNOTS	0.000	.001	.015	.041	.058
STRIKE WITHIN ORSA+W.BEN	0.000	0.000	.000	.002	.005
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.002	.016	.029
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.002	.004
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.001
STRIKE WITHIN EAST INDIA	0.000	.073	.302	.496	.591
WINDS OF AT LEAST 40KNOTS	0.000	.073	.302	.484	.589
WINDS OF AT LEAST 65KNOTS	0.000	.064	.270	.430	.516
WINDS OF AT LEAST 100KNOTS	0.000	.002	.129	.063	.096



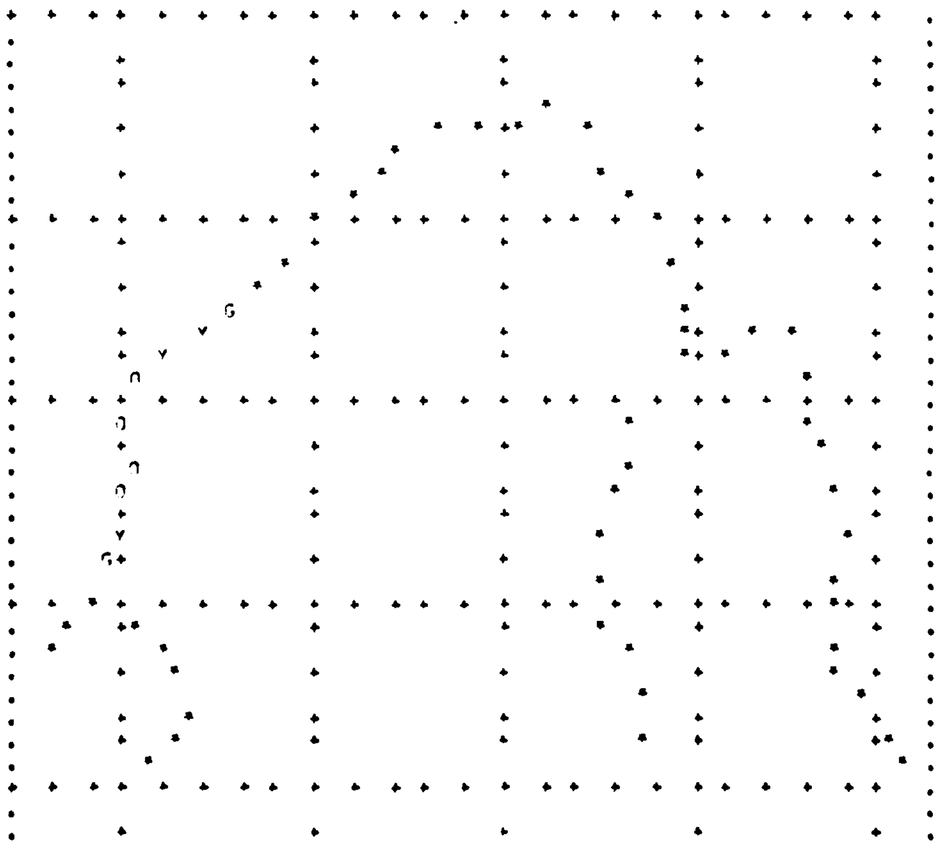
17-79 111121017 12?N 83?E 75? 17?N 81?E 45? 14?N 79?E 50? 48
FOR CYCLONE 17-79 FROM 111210?
PROBABILITIES OF EVENTS WITHIN 12HRS 24HRS 36HRS 48HRS
HOURS OF DARKNESS ** * ***** * *****

STRIKE WITHIN SRI LANKA	0.000	0.000	.001	.003	.007
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.002	.007	.016
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.001	.003	.006
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.001	.001
STRIKE WITHIN TAMIL NADU	0.000	.027	.090	.140	.178
WINDS OF AT LEAST 40KNOTS	0.000	.069	.213	.304	.364
WINDS OF AT LEAST 65KNOTS	0.000	.031	.102	.154	.188
WINDS OF AT LEAST 100KNOTS	0.000	.001	.008	.019	.028
STRIKE WITHIN AN PRADESH	0.000	.035	.124	.305	.377
WINDS OF AT LEAST 40KNOTS	0.000	.055	.232	.380	.465
WINDS OF AT LEAST 65KNOTS	0.000	.031	.140	.274	.334
WINDS OF AT LEAST 100KNOTS	0.000	.001	.018	.045	.064
STRIKE WITHIN ORISSA+W.BEN	0.000	0.000	.000	.004	.009
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.006	.029	.046
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.004	.008
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.001	.002
STRIKE WITHIN EAST INDIA	0.000	.062	.269	.443	.563
WINDS OF AT LEAST 40KNOTS	0.000	.062	.269	.443	.561
WINDS OF AT LEAST 65KNOTS	0.000	.055	.240	.393	.491
WINDS OF AT LEAST 100KNOTS	0.000	.002	.026	.065	.094



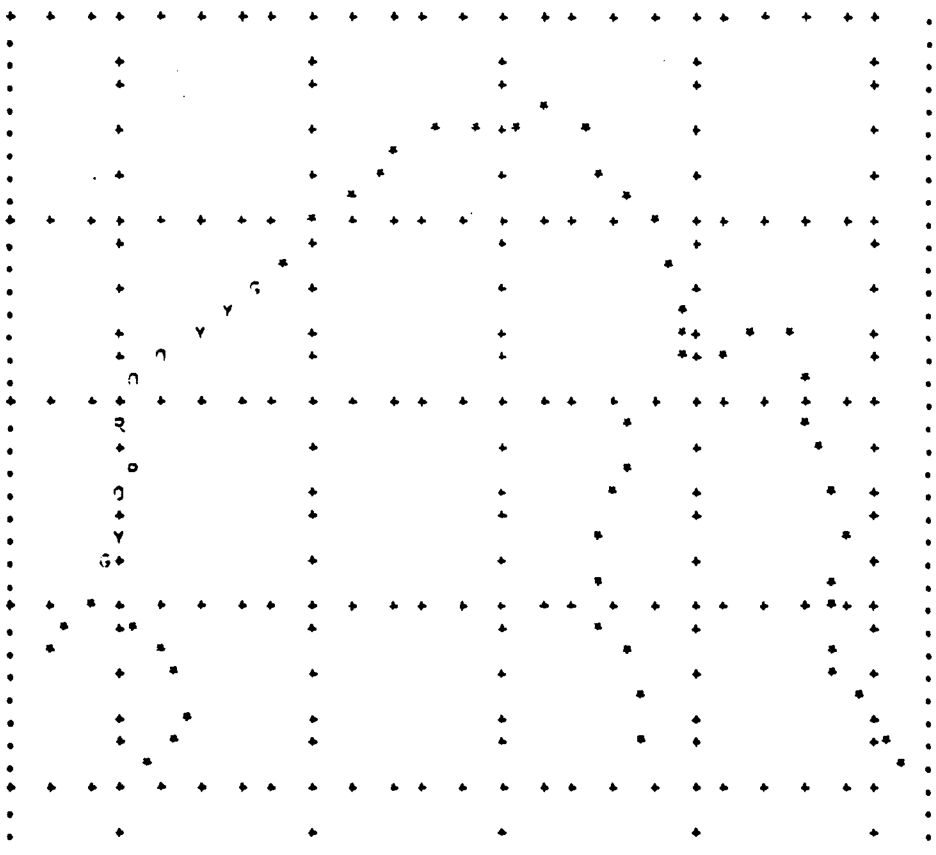
17-79 111107777 1314 426E 20K 141N 819E 35K 146N 791E 30K 48
FOR CYCLONE 17-79 FROM 1107000
PROBABILITIES OF EVENTS WITHIN 0HRS 12HRS 24HRS 36HRS 48HRS
HOURS OF DARKNESS * ***** * ***** *

	0HRS	12HRS	24HRS	36HRS	48HRS
STRIKE WITHIN SRI LANKA	0.000	0.000	.000	.001	.003
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.001	.003	.008
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.002	.004
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.000	.001
STRIKE WITHIN TAMIL NADU	.001	.041	.091	.129	.159
WINDS OF AT LEAST 40KNOTS	.004	.151	.273	.337	.346
WINDS OF AT LEAST 65KNOTS	.001	.052	.109	.143	.177
WINDS OF AT LEAST 100KNOTS	.000	.002	.009	.017	.025
STRIKE WITHIN AN PRADESH	.002	.111	.287	.399	.456
WINDS OF AT LEAST 40KNOTS	.002	.145	.350	.514	.589
WINDS OF AT LEAST 65KNOTS	.002	.103	.263	.362	.410
WINDS OF AT LEAST 100KNOTS	.000	.006	.030	.056	.071
STRIKE WITHIN ORSA+W.BEN	0.000	0.000	.001	.004	.009
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.010	.033	.046
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.004	.007
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.001	.002
STRIKE WITHIN EAST INDIA	.002	.152	.373	.532	.623
WINDS OF AT LEAST 40KNOTS	.002	.152	.373	.531	.621
WINDS OF AT LEAST 65KNOTS	.002	.141	.346	.478	.552
WINDS OF AT LEAST 100KNOTS	.000	.008	.029	.073	.097



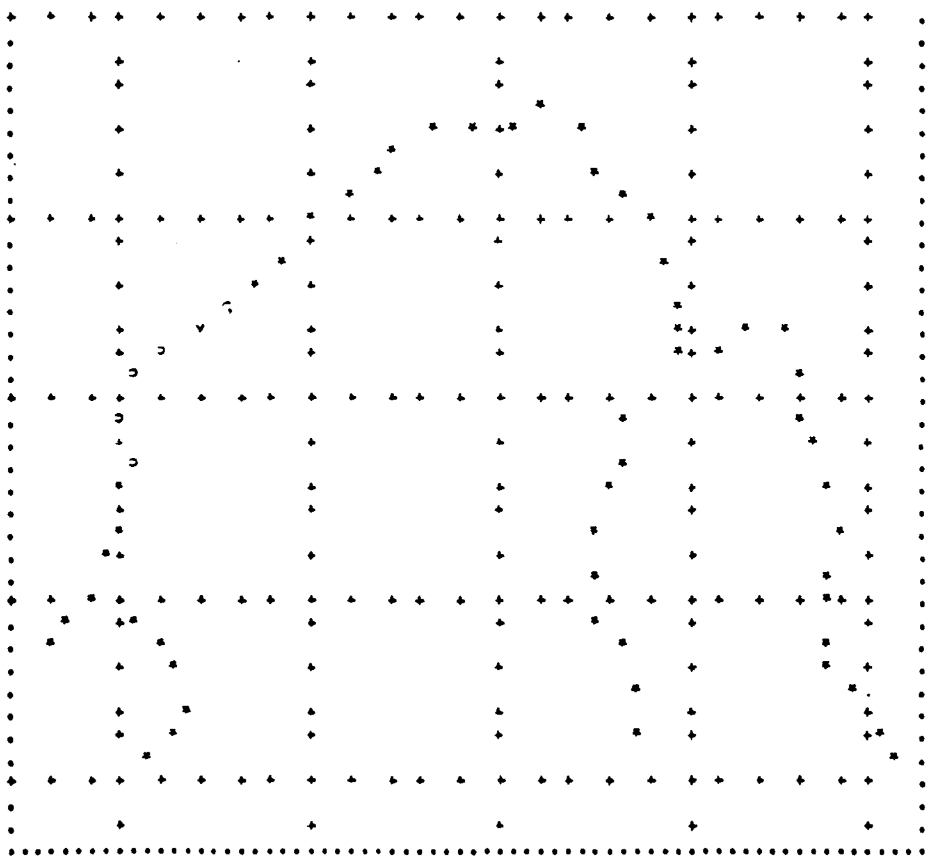
17-79 111123327 130N 823E 30K 140N 805E 105K 147N 789E 30K 48
FOR CYCLONE 17-79 FROM 1123327

PROBABILITIES OF EVENTS WITHIN	6HRS	12HRS	24HRS	75HRS	48HRS
HOURS OF DARKNESS	+	*****+	+	****+	+ ***
STRIKE WITHIN SRI LANKA	0.000	0.000	.000	.001	.003
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.000	.003	.007
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.000	.001	.004
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.001	.002
STRIKE WITHIN TAMIL NADU	.002	.051	.098	.130	.155
WINDS OF AT LEAST 40KNOTS	.008	.204	.353	.431	.477
WINDS OF AT LEAST 65KNOTS	.003	.076	.141	.192	.211
WINDS OF AT LEAST 100KNOTS	.000	.016	.044	.067	.084
STRIKE WITHIN AN PRADESH	.005	.163	.343	.443	.489
WINDS OF AT LEAST 40KNOTS	.008	.214	.477	.563	.625
WINDS OF AT LEAST 65KNOTS	.005	.152	.343	.446	.492
WINDS OF AT LEAST 100KNOTS	.001	.053	.162	.234	.264
STRIKE WITHIN ORSA+W.BEN	0.000	0.000	.001	.004	.007
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.010	.030	.041
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.001	.004	.006
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000	.002	.004
STRIKE WITHIN EAST INDIA	.008	.214	.442	.577	.650
WINDS OF AT LEAST 40KNOTS	.008	.214	.442	.577	.650
WINDS OF AT LEAST 65KNOTS	.008	.213	.440	.573	.645
WINDS OF AT LEAST 100KNOTS	.001	.068	.205	.302	.350



17-79 11111400Z 142N 833E 45K 145N 783E 30K 0N 0E 0K 24
FOR CYCLONE 17-79 FROM 111400Z
PROBABILITIES OF EVENTS WITHIN 0HRS 12HRS 24HRS
HOURS OF 35KNOTS? ***** * *****

STRIKE WITHIN TAMIL NADU	.072	.037	.068
WINDS OF AT LEAST 40KNOTS	.138	.411	.452
WINDS OF AT LEAST 65KNOTS	.037	.011	.013
WINDS OF AT LEAST 100KNOTS	.001	.002	.003
STRIKE WITHIN AN PRADESH	.132	.612	.757
WINDS OF AT LEAST 40KNOTS	.134	.519	.776
WINDS OF AT LEAST 65KNOTS	.132	.610	.766
WINDS OF AT LEAST 100KNOTS	.053	.194	.251
STRIKE WITHIN ORSA+W.BEN	0.000	0.000	.001
WINDS OF AT LEAST 40KNOTS	0.000	0.000	.017
WINDS OF AT LEAST 65KNOTS	0.000	0.000	.001
WINDS OF AT LEAST 100KNOTS	0.000	0.000	.000
STRIKE WITHIN EAST INDIA	.134	.619	.776
WINDS OF AT LEAST 40KNOTS	.134	.519	.776
WINDS OF AT LEAST 65KNOTS	.134	.617	.773
WINDS OF AT LEAST 100KNOTS	.053	.195	.254



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17-79 111222017 144N 875E  ?0K 14?N 785E  30K    0N    0E    0K 24
FOR CYCLONE 17-79 FROM 1222017
PROBABILITIES OF EVENTS WITHIN  0HRS 12HRS 24HRS
               HOURS OF DARKNESS  +      ***** +

  STRIKE WITHIN TAMIL NADU       .001  .005  .007
   WINDS OF AT LEAST  40KNOTS  .213  .330  .373
   WINDS OF AT LEAST  65KNOTS  .001  .007  .011
   WINDS OF AT LEAST 100KNOTS  .000  .001  .001

  STRIKE WITHIN AN PRADESH       .253  .545  .688
   WINDS OF AT LEAST  40KNOTS  .254  .543  .696
   WINDS OF AT LEAST  65KNOTS  .252  .541  .680
   WINDS OF AT LEAST 100KNOTS  .034  .091  .129

  STRIKE WITHIN ORSA+W.BEN     0.000 0.000  .001
   WINDS OF AT LEAST  40KNOTS 0.000 0.000  .016
   WINDS OF AT LEAST  65KNOTS 0.000 0.000  .001
   WINDS OF AT LEAST 100KNOTS 0.000 0.000  .000

  STRIKE WITHIN EAST INDIA       .254  .549  .696
   WINDS OF AT LEAST  40KNOTS  .254  .543  .696
   WINDS OF AT LEAST  65KNOTS  .253  .545  .687
   WINDS OF AT LEAST 100KNOTS  .034  .092  .130
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